THE IRON AGE

THE NATIONAL METALWORKING WEEKLY June 8, 1950

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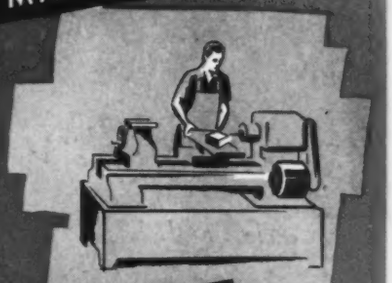
HOW TO SAVE MONEY

IF YOU ARE A MAN WHO...

DESIGNS

MANUFACTURES



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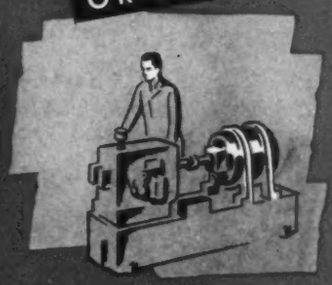
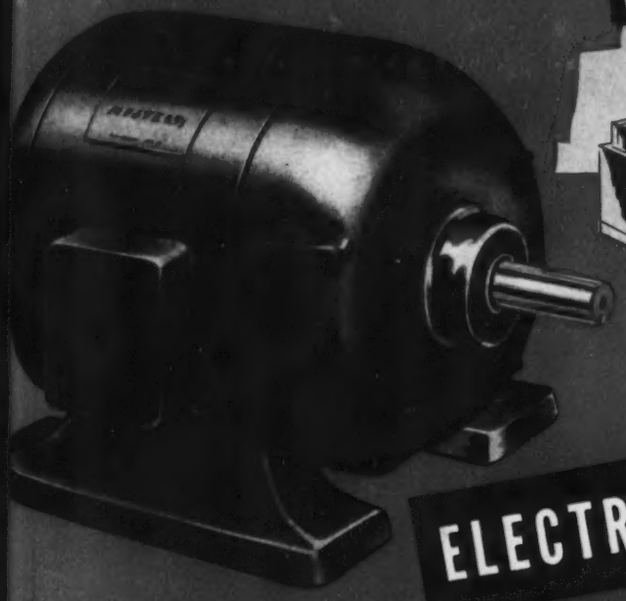




ELECTRIC MOTORS

As almost everyone knows, many modern electric motors never need re-lubrication.

They run—an ever-increasing number of them—on New Departure self-enclosed ball bearings. For these are the bearings which (1) keep lubricant in, (2) keep dirt out, (3) reduce maintenance, and (4) simplify design.

These New Departure ball bearings save motor users money in several ways. They reduce lubrication costs to zero! They eliminate burnouts, costly repairs and lost time due to over or undergreasing. And they make motors last longer—as evidenced by numbers of installations that have been running for many years without attention.

Yes, you can save money by being certain the electric motors you design or manufacture or use are equipped with New Departure self-sealed ball bearings.

Interesting booklet "Sealed" will be mailed promptly to requests on business letterheads.

Nothing Rolls Like a Ball... **NEW DEPARTURE**
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

AS COMFORTABLE AS AN EASY CHAIR

NEW! WHITING CRANE Eliminates Operator Fatigue!

INSURES A SAFE, SMOOTH OPERATION

A crane is no safer than the operator who runs it. Old-fashioned "stand-up-and-lean" crane cabs quickly tire the operator and drastically reduce his efficiency after a few hours.

Now, in the new Whiting Crane, this fatigue is eliminated. The operator sits in the scientifically comfortable Roto-Chair, with instant-acting magnetic controls at his finger tips. Yet he has perfect vision of the working area below.

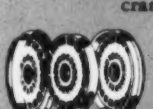
Even after hours on the job, the operator retains the split-second alertness he needs to handle the crane efficiently and to protect the safety of his fellow workers. Whiting Corporation, 15601 Lathrop Avenue, Harvey, Illinois.

Offices in Chicago, Cincinnati, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, and St. Louis. Agents in other principal cities. Canadian Subsidiary: Whiting Corporation (Canada) Ltd., Toronto, Ontario. Export Department: 30 Church St., New York 7, N. Y.

NOTE THESE EXCLUSIVE FEATURES

Herringbone Gears
These precision-cut gears provide quieter, more efficient speed reduction; longer life.

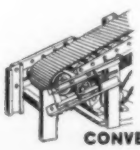
Magnetic Control
This compact, remote control system eliminates drum controls and provides delicate, finger-tip handling of all crane movements.



Fluid Drive
Liquid transmits power between motors and drives. Gives even acceleration, smoother operation. Its cushioning effect reduces maintenance costs.

WHITING OVERHEAD TRAVELING CRANES

HOISTS



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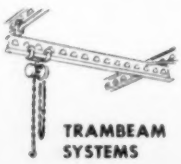
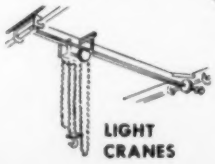


TRAMBEAM SYSTEMS



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Also: Foundry Equipment • Railroad Equipment • Metal-Working Machinery • Swenson Evaporators and Spray Dryers Food Freezers

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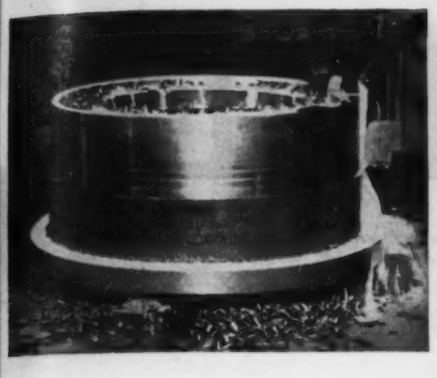

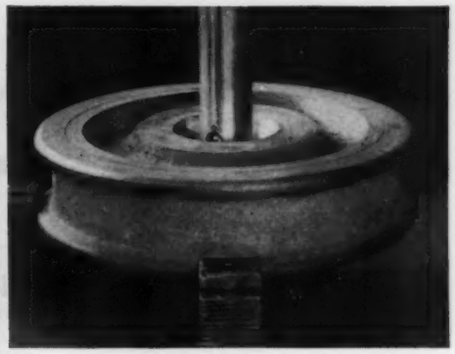

SO MANY USES FOR Bethlehem Circular Forgings

If you require circular steel blanks in the making of your products, Bethlehem has much to offer you—both in quality and variety. We manufacture blanks for a large number of end uses, and each year the list grows bigger.

Some of the best-known applications include gear blanks (spur, bevel, herringbone, miter); crane-track wheels, turbine rotors, flywheels, sheave wheels, industrial wheels, brake drums, and tire molds. But there are numerous others, and you may have in mind something that we can easily make.

Everybody talks quality, but we think Bethlehem blanks are outstanding in this respect. They are made in a mill that combines the three steps of upsetting, forging, and rolling—a process that induces strength, homogeneity, good grain structure, and uniform density. Each piece is rough-machined and cleaned up before shipping, so that you don't have to figure on handling this step in your own plant.

The blanks are available in carbon or alloy steel, heat-treated or untreated; sizes range from approximately 10 in. to 42 in. OD. We'd like to send you Booklet 216, which shows pictorially many leading uses of these products. Write to us for a copy today—or, if you prefer, a Bethlehem man will be glad to give you full details in person.

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THE IRON AGE

CONTENTS

JUNE 8, 1950 • • • VOL. 165, No. 23

Special Article

Armco Steel Corp. has taken the wraps off its patented Sendzimir continuous galvanizing process, secret since 1936. It produces a high quality product particularly suitable to sharp bending and forming operations. Other mills have since installed continuous galvanizing lines that also produce high quality galvanized sheets but this is the only one on which details have been released.—p. 71.

Issue Highlights

Proper diecasting dimensioning produces drawings that are easily understood in the die shop. Errors can be avoided. Parts can be produced to high accuracy, strength and surface finish. Scrap can be reduced, metal economy achieved.—p. 79.

High-strength, copper-impregnated, powdered iron gears have replaced malleable iron castings in the gear train of an automatic clothes washer. Savings of 60 to 70 pct over conventional gears have been reported.—p. 83.

American steel companies are adding more than 2 million tons to their annual ingot capacity this year. The gains are coming from installation of new facilities and from improvements to existing plants. An additional increase of 1,790,000 tons is already planned for 1951.—p. 91.

Legislation declaring the legality of freight absorption is on President Truman's desk following approval last Friday in the Senate. If the President signs this bill it will help clarify the pricing muddle resulting from the long controversy over basing points vs. f.o.b. mill selling.—p. 95.

Producers of stainless and alloy steels are carefully studying the effects of the 8¢ per lb increase in the price of nickel resulting from the burden of major cost increases. Although they are reluctant to raise prices, this could be the straw that broke the camel's back.—p. 97.

Coming Next Week

Regular carbon electrodes submerged in molten glass permit high temperatures not easily obtained in ordinary heating furnaces. Electrode and refractory life are greatly improved. Atmosphere control is also simplified.

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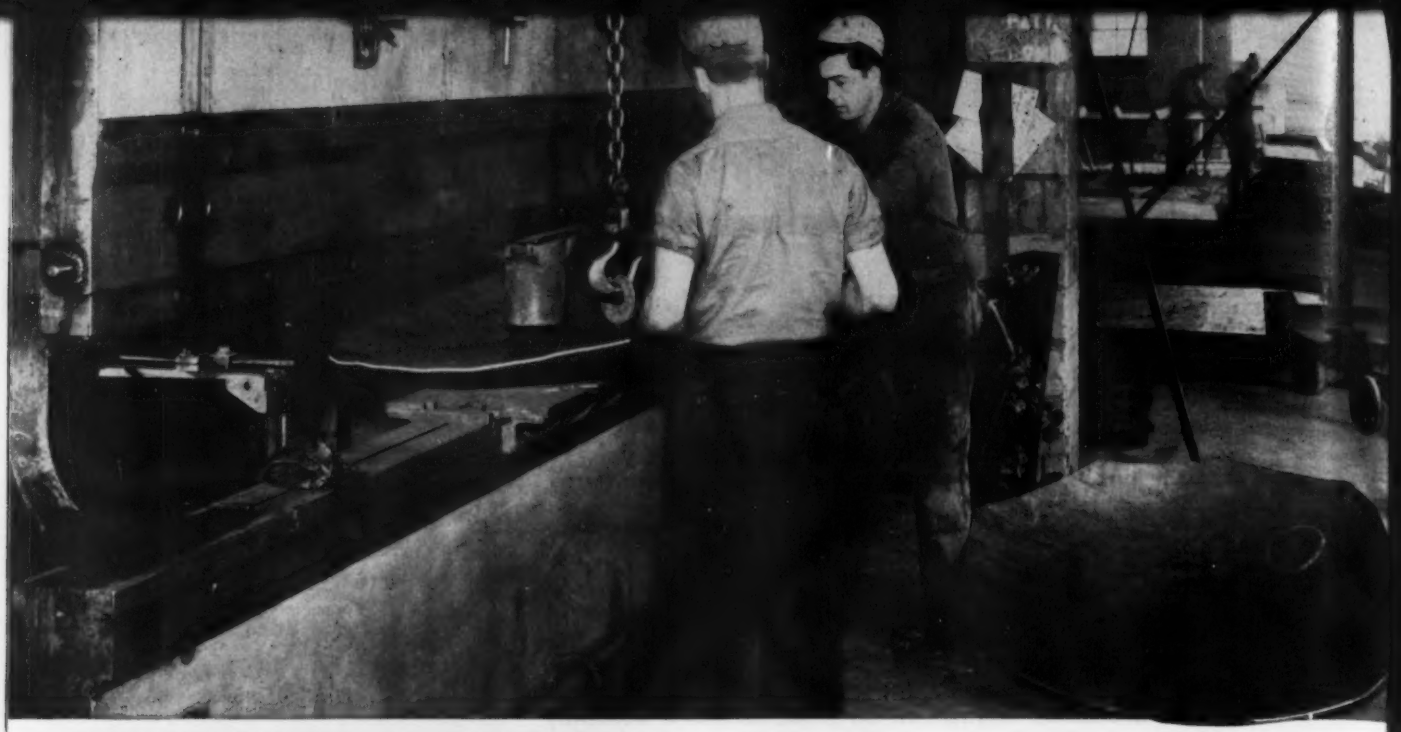

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Editorial

INDUSTRY VIEWPOINTS

Steel Capacity—Fact and Fancy

FOR years the Government boys have been using the steel industry as a whipping boy. When it isn't competition, prices and whatnot—it is the old gag—the capacity question. What are the facts?

The steel industry has always increased its capacity as the people needed it. Regardless of the pros and cons the industry has quietly expanded each year to meet increased consumer needs.

Despite this the boys in the back room go right on using the old chestnut about "not enough steel capacity." There has never been a national emergency because of a steel shortage. There was ample capacity to carry on the war and there has been ample capacity to take care of the postwar steel demand.

The current steel tightness is not due to lack of steel capacity. It is due to a loss of 29 million tons of steel because of coal and steel strikes since the end of the war. If that delayed demand had been filled at the proper time the industry today would not be operating at more than 100 pct of capacity.

Customers may not be getting all the steel they want but that was because labor troubles held up production at various times since 1946. The sad part about the Administration people is that they keep on yelling about things that just don't exist.

Federal Trade Commission people, a week ago, dragged out the old charges again. They want the FTC to again proceed against the steel industry on the basis that: First, there is no competition; and second, there has been an agreement to forestall increases in steel capacity. Both of these charges are not only stupid—they are without foundation.

What are the facts? Now brace yourself. THE IRON AGE has just succeeded in making a confidential survey on the expected increase in steel capacity during this year and during 1951. There is so much competition in the industry that we had a hard time getting the dope. That is why we had to roll together a total figure based on factual information given to us so we would not divulge some individual plans.

By the end of this year the steel industry will have added more than 2 million tons of steel capacity to the Jan. 1, 1950 figure. About a third is by new facilities, the balance is by technological changes.

There will be about another 2 million tons added to the capacity in 1951. This makes a total of about 4 million tons of capacity added in 1950 and 1951. Or to put it another way—in the 6-year period, Jan. 1, 1946 to Jan. 1, 1952 the industry will have added 11 million tons to its capacity—or about half of the steel produced in Russia last year.

Well these are the facts but it is doubtful if Washington will listen to them, believe them or call off the ballyhooers who use fancy instead of facts.

Tom C. Campbell

Editor

Lower Your Carbide Grinding Costs

with

CRYSTOLON WHEELS *in the New K-Bond*

A faster and freer cutting action combined with greatly increased uniformity in grinding action — this is what you get with the *new Norton K-Bond,* a new vitrified bond for CRYSTOLON grinding wheels both green and gray. The high rate of stock removal and the cool cutting action of the new K-Bond speed up the grinding operation and help eliminate spoiled tools — thus they reduce the over-all grinding costs.

Also, the Norton K-Bond has brought about a new standard of uniformity to vitrified bonded silicon carbide wheels. These products can now be controlled to such a degree of accuracy as to make is possible to produce wheels of half grade increments of hardness. Thus Norton wheel specifications can be "pin-pointed" to suit the individual requirements of your carbide grinding jobs.

In plant after plant, the new K-Bond CRYSTOLON wheels are showing remarkable results. *You will want to try them, too.*

NORTON
ABRASIVES

NORTON COMPANY, WORCESTER 6, MASS.

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► It now seems reasonably certain that new engines for the Ford six and eight, Lincoln and Mercury will not be introduced until the 1952 models are brought out. All will be high compression engines. Because of stiff demand, 1951 model changeovers will probably be confined to extensive face lifting rather than the major changes that had been expected.

► A West Coast aircraft firm has developed a precipitation pickle process that permits rapid and positive separation of stabilized and non-stabilized forms of 18-8 stainless steel. Testing time is shorter than with other methods and more samples can be checked at one inspection.

► A new type of home and building insulation combines a layer of aluminum foil with a layer of moisture-proof paper. Weight is less than 1/10 lb per sq ft. Dead air space forms between foil and paper.

► The British Government, which is subsidizing part of the British machine tool exhibit at the Canadian International Trade Fair, originally proposed that they also exhibit at the coming fair in Chicago, according to trade reports. Indications are that the companies declined on the ground that they had no facilities at this time to service the machines they might sell.

► Another GM high compression engine is coming up at Buick. It will be built in a separate plant but will probably closely parallel the processing being used by Oldsmobile. Big question at the moment is: Which GM division — if any — will get a new GM six-cylinder engine?

► Experiments on induction heats using two methods of introducing a 50-pct Mg—50-pct Al alloy indicate that sulfur in steel can be consistently reduced to 0.010 to 0.015, with an improvement in ductility.

► Just as it did last year, the importation of steelmaking scrap is bound to have a depressing effect on steel scrap prices. Main reason is that earmarked scrap (that returned by steel users) is on the increase. This makes the total market thinner and more sensitive to imports.

► A steel mill is now running pilot plant tests on the high frequency sound method of coalescing very fine openhearth stack particles. The technique is designed to agglomerate minute matter into masses heavy enough to be picked up by electronic precipitation.

► One important facet of the 4 million-ton 1950-1951 expansion of steel ingot capacity revealed in an Iron Age survey this week is that it is news to many people. To steelmakers it is not, except for the details. But to the general public — accustomed to Washington charges of "restrictive combinations" — it may be a surprise.

► A machine for manufacturing collapsible tubes by a new process has been developed by an Eastern manufacturer. The tubes are cut from foil coated on both sides with a plastic. The type of plastic can be varied to meet requirements of different products to be packaged.

SEALED FOR LIFE

WITH A PRESSURE-TIGHT

MEEHANITE® CASTING

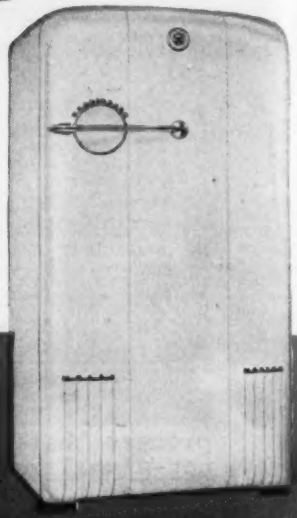

Figure 1—The famous "Kelvinator" electric refrigerator. A Masterpiece model with full-length door design.

A major design improvement in the refrigerator-compressor industry has been the development of the permanently sealed-type compressor. Nash-Kelvinator Corporation, Detroit, Michigan produces a series of home and industrial refrigerator units utilizing this principle which provides the maximum in quiet, efficient and trouble-free service life.

Figure 2—The Meehanite compressor body providing maximum properties and pressure tightness to Nash-Kelvinator compressor units.

At the time of the original change-over the main compressor body was designed as a Meehanite casting in order to obtain the maximum in pressure tightness, machinability, all-round casting quality and uniformity.

The Meehanite compressor body illustrated (Fig. 2) is subjected to 73 machining operations, one of which is diamond boring. Even a pinpoint defect under these conditions would cause leaking. Connecting rod bearing surfaces on this casting are held to .0005" tolerance. So close and accurate must be the dimensions that many measurements are made electrically.

All castings are, of course, pressure tested and the finished unit is forced under a 5½ ton pressure into a sealed dome.

Figure 3—Nash-Kelvinator Corporation "sealed for life" refrigerator compressor unit.

Take Your Casting Problems to a MEEHANITE Foundry!

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The American Laundry Machinery Co.	Rochester, New York
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E. W. Bliss Co.	Hastings, Mich. and Toledo, O.
Builders Iron Foundry Inc.	Providence, Rhode Island
Continental Gin Co.	Birmingham, Alabama
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
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The Henry Perkins Co.	Bridgewater, Massachusetts
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Planning Huge Capacity Boost

Scrap Wilder Than March Hare

Costs Forcing Premium Prices

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

AMERICAN steel companies are adding more than 2,000,000 tons to their annual ingot capacity this year. In addition, they have already scheduled an increase of 1,790,000 tons for 1951. Experience indicates that this figure will top 2 million tons, too. The gains are coming from installation of new facilities and improvements to existing plants.

These capacity increases — about 4 million tons in 2 years — were disclosed in a confidential survey of the nation's steel companies just completed by THE IRON AGE. They mean that in the 6 years following the war the steel industry will have added more than 11 million tons to its steelmaking capacity. This additional capacity alone would permit output of more steel than was made last year in either France or Germany. It is just about half of Russia's 1949 production.

Refutes Washington Statements

This is the first authoritative information on steel capacity increases this year and next. And it refutes unfounded statements coming out of Washington that steel companies were not expanding capacity. Because of the competitive aspects it was hard to squeeze out this information on capacity expansion. That is why THE IRON AGE agreed to release only a total industry figure and is not free to furnish data on individual companies.

The passage of the freight absorption bill by a 43-27 vote in the Senate last Friday was encouraging to industry. If the President signs it, as he once indicated he would, it should go a long way toward clearing up the controversial pricing muddle. It would not clear the way for a return to the basing point method of selling as has been erroneously supposed. It simply means that companies would be permitted to absorb freight, if they wished, to meet competition — provided there is no collusion. This would benefit small firms because steel companies are certain to absorb some freight, depending on the competitive angle and the individual circumstance.

Wilder Than a March Hare

The scrap market is wilder than a March hare. Prices have gone berserk and are soaring to levels undreamed of a mere few weeks ago. Big increases in the price of No. 1 heavy melting steel at major consuming centers caused THE IRON AGE steel scrap composite price to shoot up $3.67 a ton to $40.92 a gross ton. This rivals the top price obtained during the circus market of 1948. Of more significance, however, is the fact that scrap prices have been increasing faster than ever before.

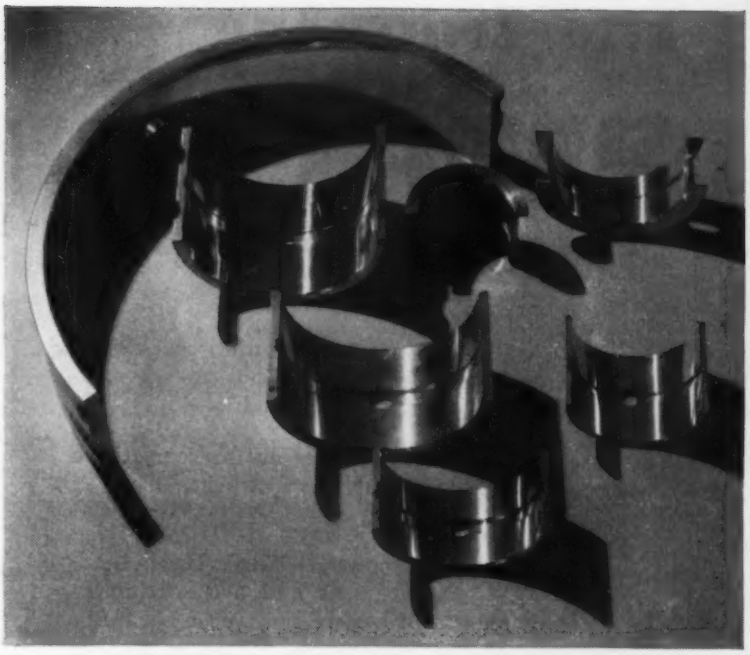
The wild advance of scrap prices is playing havoc with steelmaking costs. The tightest squeeze is being felt by the smaller companies whose operations depend more heavily on purchased scrap. But all companies are feeling it keenly.

Nonferrous metals prices are also kicking up their heels. Metals recently advanced in price include zinc, nickel, aluminum, copper, brass and bronze. Some of these price increases have boosted steelmaking costs, too.

Pressure for higher steel prices is coming from higher costs. As a result premium prices for steel are recurring with increasing frequency. This week another firm succumbed to the pressure by raising hot-rolled sheets $3 a ton, hot-rolled strip $5 a ton and cold-rolled strip $7 a ton.

Record Steelmaking Continues

Steelmaking operations are again scheduled at 101.5 pct of rated capacity this week. Steel production has been above 100 pct of rated capacity ever since the middle of April. This torrid pace can't be maintained through the hot weather and vacation periods this summer. But it is little short of a miracle that it has been sustained this long.



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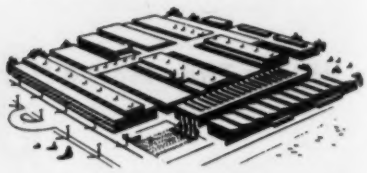

Sand & Permanent Mold Foundries

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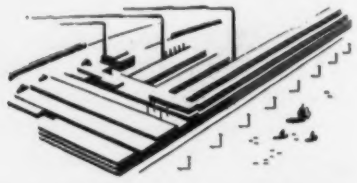


Permanent Mold Foundry

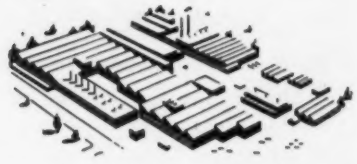
Carefully cast by the thousands at ALCOA

In diesel bearings or any other casting, the larger the quantity—the tougher your designs—the more Alcoa foundries can save you. With modern equipment and 62 years of aluminum experience, Alcoa tackles castings that others balk at.

If you want lighter products—easier handling—faster machining—freedom from finishing—you want aluminum castings.

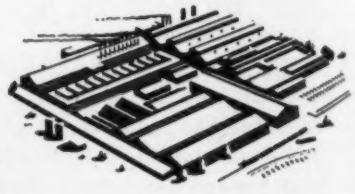
Look for Aluminum Company of America listed under "aluminum" in your phone book. Call there for an Alcoa specialist, or write: ALUMINUM COMPANY OF AMERICA, 1995F Gulf Bldg., Pittsburgh 19, Penna.

BRIDGEPORT, CONN.



Sand & Permanent Mold Foundries

LOS ANGELES, CALIF.



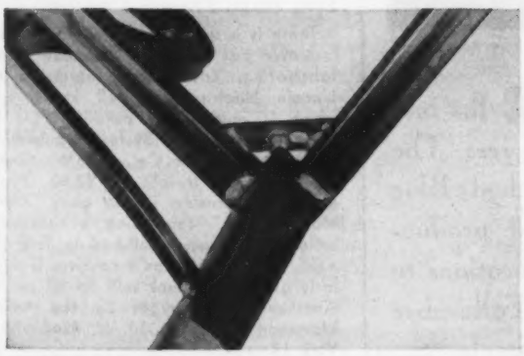
Sand & Permanent Mold Foundries

ALUMINUM CASTINGS by ALCOA

56 welds in 25 minutes!

Note smooth weld surfaces. Practically no finishing needed before painting.

No wonder they use ANACONDA 997 Low Fuming Bronze Welding Rod!



Steel chair oxyacetylene braze-welded by vapor flux method with ANACONDA *997 Low Fuming Bronze Welding Rod. Total welding time, per chair, 25 minutes. Total welds per chair, 56—or less than ½ minute per weld. Courtesy: Metal Office Furniture Company, Grand Rapids, Mich., and Purity Cylinder Gases, Inc., Grand Rapids, an* ANACONDA *Welding Rod Distributor.* ANACONDA *Welding Rods are available from distributors throughout the United States.*

When you figure cost-per-joint, finished and ready to paint, you can't beat ANACONDA 997 Low Fuming Bronze Welding Rod. That's why the Metal Office Furniture Company, Grand Rapids, Mich., uses only "997" in braze-welding their "STEELCASE" furniture assemblies.

Used with an acetylene torch and vapor flux, the bronze readily tins the steel, feathers out nicely to form flat beads or smoothly rounded fillets. Every joint is dependably strong—and ready for painting with practically no finishing. With vapor fluxing there's no excess flux to remove.

The low-fuming characteristics of ANACONDA 997 Welding Rod permit faster welds and clean finished work. Insist that your supplier furnish you with genuine ANACONDA 997 Rod. If he can't, tell us. Please address The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 50189

you can depend on

BRONZE WELDING RODS

strip for action . . .

FOLLANSBEE POLISHED BLUE STRIP will give you real action in the production-line because it's furnished in coils for feeding right into your automatic machines. For the utmost efficiency and economy in continuous operations try this superior Follansbee Polished Blue in coils—the distinctive color is a real asset in any product.

making figurines for faddists

FOLLANSBEE POLISHED BLUE STRIP fits into many types of products, figurines or furnishings or fryers. The uniform-blue, high-gloss finish of Follansbee Polished Blue attracts discriminating buyers. In coils for automatic productioneering, and with mechanical and physical specifications to fit your needs, you'll find it worth while to tool for Follansbee Polished Blue and the other Follansbee Specialty Steels.

Dear Editor

Letters from Readers

Can You Furnish . . .

Sir:

We have read a number of articles in your magazine on pressure castings and are interested in contacting a number of these concerns who might be willing to do this work for other concerns. Our needs are in nonferrous castings that would weigh about 3 to 5 lb each, where a gang of impressions can be cast at one time and give a sharp clean casting with very little shrinkage.

M. CHAREN
Universal Dental Co.
Philadelphia

Readers wishing to contact Mr. Charen can address him at the above company, Brown at 48th St., Philadelphia 39.—Ed.

Incentive Pay Info

Sir:

We are contemplating installing an incentive pay system in our plant and are looking for the best information on the subject. We will appreciate any references you can give us.

J. R. MOONEY
General Manager
Texasteel Mfg. Co.
Fort Worth, Tex.

There is a singular lack of information on incentive pay systems as applied to metal fabricating. You may be interested in the Lincoln Electric Co., well known system, which is outlined in detail in the book "Lincoln's Incentive System," published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18. It sells for $2.50. You also may be interested in the book "Practical Management," comprising a collection of articles previously published in THE IRON AGE. The chapter on incentives is particularly good. This book sells for $3 per copy. Another source might be the American Management Assn., 330 W. 42nd St., New York 18.—Ed.

Wants Finishing Products

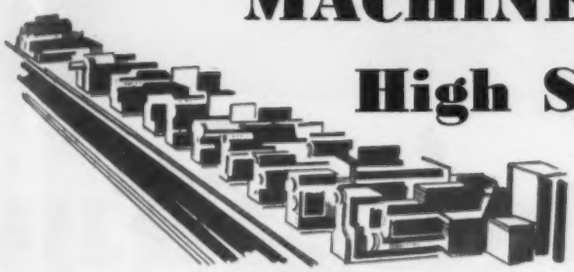
Sir:

As subscribers to THE IRON AGE, and being bicycle manufacturers, we are interested for our own plant in metal finishing products for barrel polishing, chemical polishing, bright nickel and chrome plating, and pray you to put us in contact with manufacturers.

J. F. BEISTEGUI
Beistegui Hermanos S. A.
Eibar, Spain

Suppliers of such products may wish to contact this company, whose address is Apartado 33 in Eibar.—Ed.

MACHINE TOOL High Spots



Sales Inquiries and Production

By W. A. LLOYD

Foreign Tools—Focal point of U. S. machine tool builders' competition this week is the Canadian International Trade Fair at Toronto, featuring the biggest display of British tools and machine tools ever staged in Canada.

Indicative of the effort being made, some 15,000 copies of a 160-page catalog or "advance guide" to the tool, machine tool and scientific instrument sections have been distributed in Canada alone.

Some Ready—Sir Holland Goddard, chairman of the British section, states in a preface to the advance guide, that "nothwithstanding the heavy orders already on hand, many of the exhibits can be offered for immediate delivery. In other instances, two new methods of marketing policy have been introduced to satisfy Canadian needs . . . a deliberate over-production for the purpose of creating reserve stocks . . . and to give first priority to orders from Canada and where technical considerations make it practicable, goods will be diverted from other markets."

It is understood that a number of sales executives from U. S. machine tool companies are at the fair for a first hand inspection of the British machine tool line.

Buying Tools—In Philadelphia, an encouraging note was sounded by William L. Batt, president of S.K.F. Industries, who said that owing to keener competition and the need for finding new ways to reduce production costs, manufacturers are buying more machine tools than at any time during the past 4 years.

According to Mr. Batt, rising casts and the fact that the consumer wants more for his dollar have broadened the market for new and more efficient machinery.

He said orders for such equipment are more than double those of July 1949, postwar low-point of the machine tool industry, and currently are at a rate that may reach $300 million this year.

More Efficiency—"The renewed interest of manufacturers in new machine tools, reflected in an increased demand for ball and roller bearings, indicates a determination to balance spiraling costs with machinery that can do jobs better, faster and cheaper," Mr. Batt said.

The competition that now prevails for the consumer's favor is nowhere better illustrated than in the automotive industry, which is allotting a third of its expenditures for retooling, he said.

Engines in '52—With the tooling program for the new Ford 6 to be built at Cleveland almost completed, most of the attention is now turned to the new Lincoln engine to be built at the Rouge plant.

It now seems clear that Ford will probably be able to convert a substantial amount of its present equipment to the new job. Quotations are being requested on the job but only long term equipment has been placed, the trade reports. The probability is that none of the new Ford engines will be ready before 1952 models are introduced.

Activity Continues—Chrysler is continuing its activity, which involves a move of its six-cylinder engine from the Chrysler-Jefferson plant to its Warren Avenue DeSoto plant. In addition, there has been some recent ordering, apparently aimed at filling in the weak spots of the Dodge engine line.

Transmission Delay—A new transmission to be built by the Detroit Transmission Division of General Motors is apparently undergoing some engineering pains. Some hold-ups on equipment have recently been reported.

With deliveries on some machines at least 6 months away, it is now believed the earliest date for the new transmissions which will supersede the present hydramatic is January 1951.

More New Engines—Buick has some long-range engine plans that seem about to emerge. While there is no official confirmation, it is believed that Buick is planning a new high compression engine plant which will supplement and later replace the present line that is turning out a record volume of engines.

The new plant will undoubtedly be housed in a separate building. The new engines are at least 2 years away, according to informed sources.

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YES, We handle short runs, Too!

. . . As Well As Long Ones

And just as carefully. Whether you order one gross or a million you can be sure that ATLAS Fastenings — Bolts, Nuts, Screws and Washers, in all types of metals—in your product will never cause a reject.

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METAL STAMPINGS
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Let us send you our big new catalog—just off the press. A dependable Purchasing Guide to all your fastening requirements. Whether its cataloged or "special" Atlas can supply you with prompt and efficient service.

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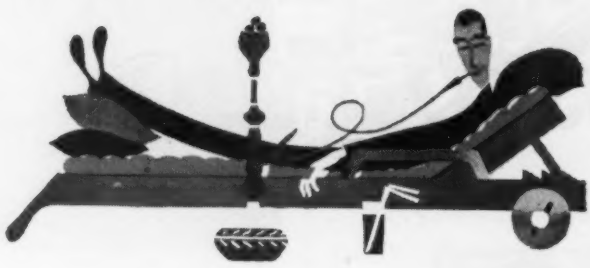


Fatigue Cracks

By CHARLES T. POST

Stole the Show

Hughes Wasserman, 76-year old welding pioneer—he's been in the field since 1898 — and father of Rene Wasserman, president of Eutectic Welding Alloys Corp., recently visited this country for the first time. His reminiscences of the infancy of welding point up the difficulties in demonstrating the future of any industrial process.

When Kaiser Wilhelm heard of the Thermit process — which the elder Wasserman helped develop— he commanded a personal demonstration. The Kaiser watched carefully as Wasserman, eager to impress, went through his paces.

Wilhelm apparently marveled, but offered only one comment as he turned to his aide:

"What a way for a burglar to open a safe!"

Aptronyms

C. G. zur Horst, Gulf Research & Development Co., reports that arrangements for Pittsburgh district bakers to fly to their national convention were handled by none other than . . . Paul M. Baker.

Managing Editor George Sullivan whispers the intelligence that the executive secretary of the National Advisory Committee for Aeronautics is a sure winner . . . J. F. Victory.

James Crill, Time-O-Matic Co., suggests we tap A. E. Fawcett, president of Texas Water Wells, Inc., as another whose name fits his job.

But our favorite aptronym in action is the young lady, spotted by C. C. Finn, who succeeded in getting a Pocatello, Idaho, judge, to dismiss an overtime parking charge. Fonda Parkin said she put the coin in the wrong meter.

More Power

Our curiosity about General Electric's "More Power To America" exhibit train was whetted when we saw it parked in Grand Central Station. When we read the headline on G.E.'s ad a couple of weeks ago, we're even more curious. The head read:

"G. E. Electronic Control for Resistance Welding Speeded Fabrication 100%. Cut Rejects 75% on Cars for G. E.'s More Power To America Train."

It's easy enough to dispose of a rejected can opener or a rejected ball bearing, but what in the devil would a car builder do with a rejected railroad car? Sounds like those electronic controls came just in time to avoid a nasty situation.

Puzzler

Ann, who hasn't aged a day since last week's puzzle, is sweet 16.5 years old, and certainly hasn't been kissed by anyone who tried to figure out the answer.

The $1000—10 envelope problem was no trouble at all for talent like Ernest E. Thum, E. J. Sampson, and Charles G. Heilman. And the grazing cow slowed up only slightly L. E. BeMiller, Walter L. Jackson, and Martin Baron.

Joe T. Brashears, W. C. Caye & Co., Atlanta, wants to know, "starting at 12 o'clock, how many times do the hands of a clock form a straight line in opposite directions in 24 hr?" He doesn't say whether daylight or standard time.

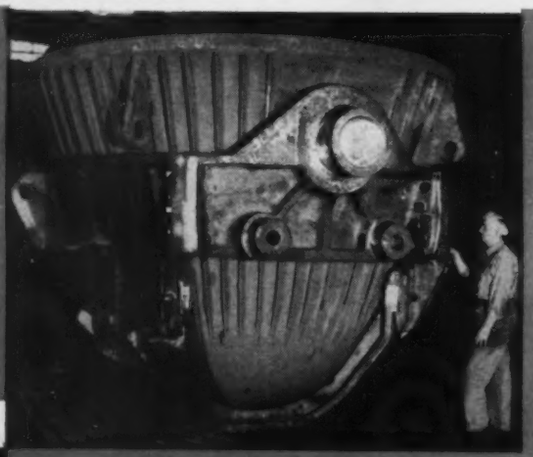
MILL EQUIPMENT

Side Tilt Ingot Car—Remote Control

Ingot
Mold Car

STEEL CASTINGS

20 TO 250,000 POUNDS



Cinder Pot

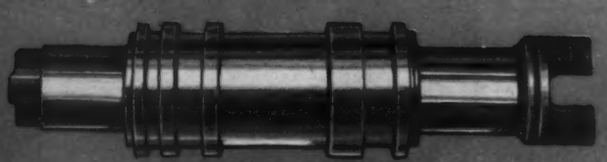
Continental

Continental

FOUNDRY & MACHINE CO.

CHICAGO · PITTSBURGH

Plants at East Chicago, Ind. • Wheeling, W.Va. • Pittsburgh, Pa.



ROLLS

IRON, ALLOY IRON AND STEEL

METAL FORMING NEWS

OTHER FENN-STANDARD ROLLING MILLS

Fenn-Standard makes rolling mills for the rolling of ingot, rod or strip and are built to your requirements.

Four-High Precision Mills roll stock to uniformly close tolerances.

Three-High Mills are available for rolling rod — grooved rolls reduce billets of ferrous and non-ferrous metals to rod.

Two-High Mills emboss and do general sizing and finishing work.

Roll sizes for these mills vary 1½" diameter and 1" face to 16" diameter and 18" face. They can be furnished for both hot and cold rolling, or for grading, cross and pinch rolling or forming wire to dimensions.

Roll speeds range from 10′ to 500′ per minute. Numerous attachments are available for special work, making the basic Fenn-Standard Mills highly versatile machines.

Tandem Wire Flattening Mills Speed Output, Cut Costs

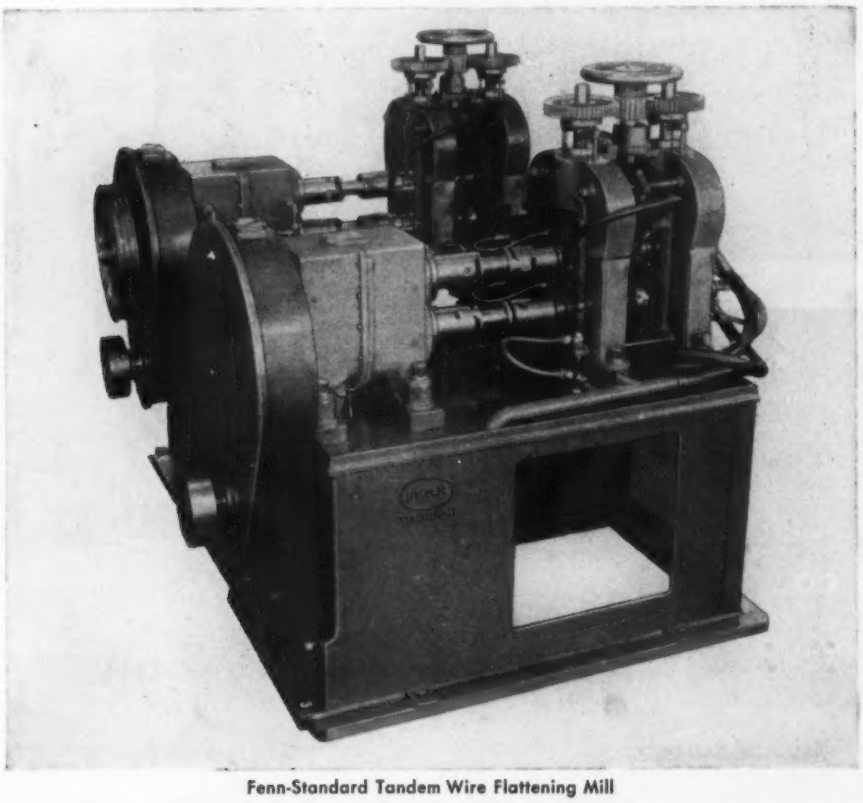
Wire flattening mills which do the complete flattening operation in a single pass, and which operate at speeds up to 2000 feet per minute, are taking over more and more jobs in the metal industries as manufacturers search for new ways to cut production costs and speed output.

Ability to handle ferrous or non-ferrous alloys and stainless steel rapidly to close tolerances enables Fenn-Standard mills to lower unit costs substantially below equivalent work done on single stands.

Up To Five Stands On Tandem Units

The principle of tandem operation saves a great deal of handling and lessens the number of operators required on any given job. Fenn-Standard mills can be obtained in tandem units up to five on a single stand or base. Roll diameters from 3.5" to 12" allow these mills to handle the whole range of commerial wire sizes.

Tandem mills provide the most efficient wire flattening method known. Industrial plants have been converting their plants from single stand operation to tandem units to get the benefits of reduced costs and greater output.



Fenn-Standard Tandem Wire Flattening Mill

Precision Engineering Accounts for High Performance of Tandem Mills

Modern design, careful engineering, generous dimensions of parts and close tolerances account for the extraordinary performance of Fenn-Standard tandem mills. Yankee craftsmanship combined with carefully controlled materials help account for their high production rates and minimum maintenance over a long service life.

Roller Bearings are used on roll necks and preloaded ball bearings in pinion stand.

Each mill stand is driven by herringbone pinion stands through universal joints to the roll necks in order to eliminate chatter marks on the work.

Rolls are easily raised and lowered through the individual or simultaneous operation of screw downs.

Rolling speeds are electrically synchronized from stand to stand.

Cooling of rolls is either internal or external at your option.

Roller bearings and pinion stands are lubricated with recirculated oil to deliver clear, cool, oil continuously for minimum friction and longer life.

Idling or power driven edgers for use between stands control widths to close tolerances.

Fenn-Standard edgers have been designed to meet the requirements of rigidity so important to holding small tolerances. The edger rolls are mounted in preloaded ball bearings, lubricated for life, and the preloading principle is carried throughout the entire edger.

Ribbon wind and traversing take-up reels are available.

Hydraulic traversing offers the ultimate in flexibility and the drives produce constant tension winding.

Rotary Swaging Gains Favor as Faster, Better Way to Shape Metal

Increasing numbers of metal working plants are adopting rotary swaging for tapering, forming, reducing and assembly operations because of large savings in time, labor and materials as well as important improvements in the physical properties of the metal being worked.

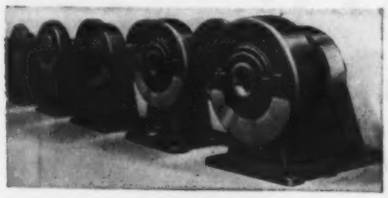
Saves Time and Labor With No Loss of Material

Rotary swaging is a forging process in which tubular or solid bar stock is shaped by means of repeated blows applied by rotating dies. The process develops cylindrical, conical, "necked" and other special shapes *with no waste of material.*

Most swaging operations require only a few seconds. Even on difficult work, the length of time required is much less than that needed to secure equal results by other processes. So simple to use that highly skilled operators are not required.

Other Important Benefits From Swaging

Like forging, swaging improves the grain structure, hardens the material and gives it increased elasticity and tensile strength. The hammering action imparts a high finish to the surface which in most cases need not be given further treatment. A high degree of accuracy is possible. Close tolerances can be held. Tubular parts often develop enough wall thickness to permit threading.



← Fenn-Standard Rotary Swagers are available to handle work as small as .015" to .020" diameter, solid bar stock up to 3¾" diameter and tubular stock up to 6" diameter. Machines with larger capacities can be designed and built to order.

Plant Replaces 5 Rolling Mills With One Tandem Turks Head, Cuts Costs

The high speed and versatility of tandem Turks Heads has enabled many manufacturers to secure remarkable production economies by using them in place of older style equipment.

One manufacturer has replaced five rolling mills with one tandem Turks Head — at comfortable cost savings and with no loss of productive capacity. Others have been able to reduce costly inventory to a minimum number of finished stock sizes because their Fenn-Standard tandem Turks Heads allow them to fill job lot orders more quickly than ever before.

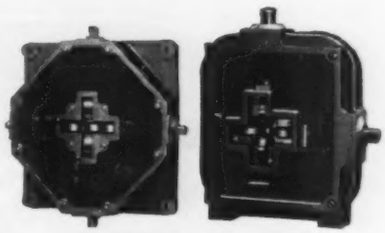
From round wire to finished shape in one pass through tandem Turks Heads has opened up an efficient, low-cost way to form wire and edge strip stock for increasing numbers of manufacturers.

Operation of these machines is fast and simple. The heads can be changed in ten minutes — the work turned out in little time. Fewer sizes of starting rounds are needed — less raw stock is used — waste is cut to the vanishing point — inventory problems are minimized.

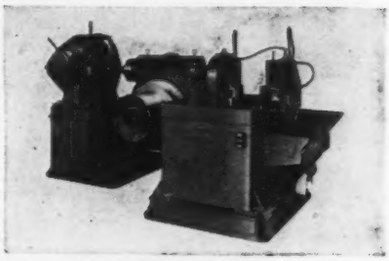
Turks Heads Use No Dies

The work is *rolled* to shape, giving the added benefits of improved metal structure, greater tensile strength, greater accuracy and higher production rates as compared with dies.

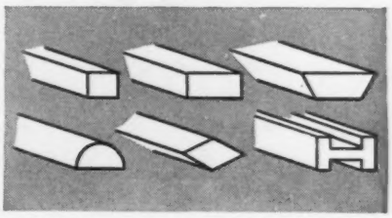
For rectangular sections, short runs and light reductions, Fenn-Standard Universal Type Turks Heads are used. For forming rectangles and special shapes, with long runs and heavy reductions, Plain Type Turks Heads are specified. Material is rolled on both vertical and horizontal planes simultaneously. Close tolerances are maintained.



Left: Plain Type Turks Head.
Right: Universal Type Turks Head.



Fenn-Standard Tandem Turks Head. Handles all round wire in size range .40" to 1.250".



Some cross-sectional shapes obtainable with Fenn-Standard Turks Heads.

FENN

THE FENN MANUFACTURING COMPANY
1845 Broad Street
Hartford 1, Connecticut

Shaping metal for better and stronger products at lower cost

Fenn-Standard Machines Are Sold By:

Chicago
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Grand Rapids
Joseph Monahan

Indianapolis
Indianapolis Machinery & Supply Co.

Los Angeles
Hoffman & Heartt

Milwaukee
Neff Kohlbusch & Bissell

Minneapolis
Northern Machinery & Supply Co.

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New York
Indianapolis Machinery Export Co.
Maxwell Roney, Inc.

Pittsburgh
Wm. K. Stamets Co.

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Seattle
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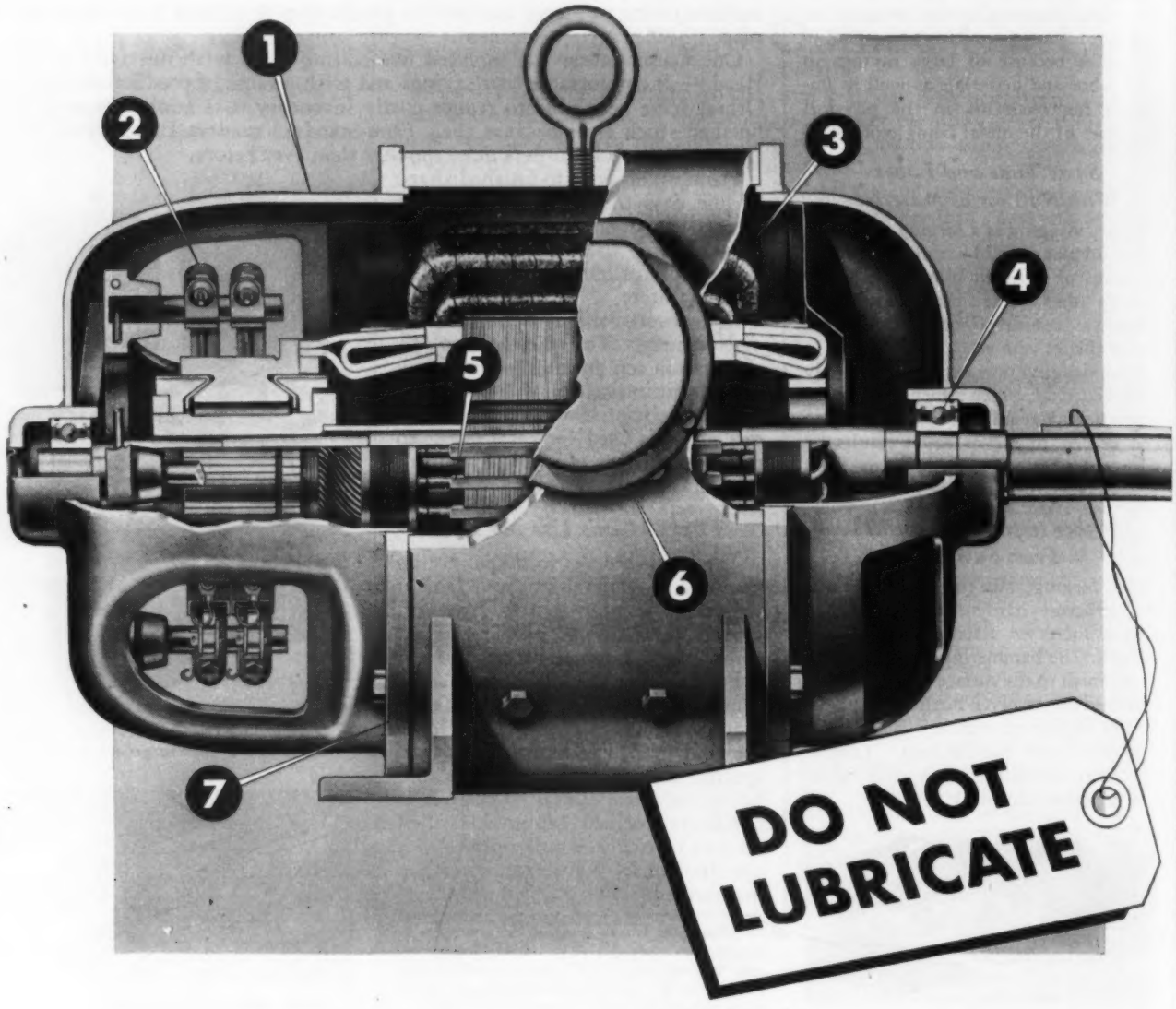
Montreal, Quebec, Toronto, Windsor
Williams & Wilson, Ltd.

YOU CAN BE **SURE**.. IF IT'S
Westinghouse



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6. STEEL-GASKETED CONDUIT BOX
7. ROLLED-STEEL FRAME

If you figure LIFE-COSTS... you'll figure LIFE-LINE

SK DEPENDABILITY
Wrapped in Steel
in the NEW Life-Line D-C MOTOR

Thirty-nine years at hard labor—in steel mills . . . in mines . . . in a thousand and one applications—have proved the dependability of the type SK d-c motor. Now, new dependability has been added—new motor stamina . . . new freedom from maintenance . . . new value for d-c motor users.

MAXIMUM STRENGTH AND RIGIDITY—Heavy steel end brackets and rolled-steel frame stand up to the shocking, jarring blows so often encountered in rugged d-c service.

SIMPLIFIED SERVICING—Readily accessible through spacious opening in front bracket, brushholders may be removed individually. Armature coils, wound from Tufvar wire and treated in Thermoset varnish assure long life . . . reduce trouble from shorts and grounds. Double-sealed pre-lubricated bearings (proved in over half a million motors) put an end to greasing problems.

INDIVIDUAL FIELD COIL UNITS—One coil may be replaced without expense of replacing all . . . or discarding pole piece. Just slip the new coil in place . . . save repair costs.

These are a few highlights of the new, all-steel Life-Line type SK d-c motor. Get the complete facts on series, shunt, or compound motors . . . frames 203-365 . . . in 1 to 30 hp ratings. Contact your local Westinghouse representative. Ask for a copy of "D-C Motor" Booklet B-4595, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21549

Westinghouse
Life-Line
D-C Motors

FREE — USE POST CARD

PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Electronic Core Drying

The Foundromatic sand core dryer, designed to cut core drying time from hours to minutes, is covered in a new 6-p. folder. Consisting of an oven and a dielectric heater, the dryer is described as providing better quality cores at lower fuel costs and with less handling, as well as improving working conditions. Use of the dryer is explained, pointing out that few changes in present techniques and auxiliary equipment are required. *Allis-Chalmers Mfg. Co.*

For free copy check No. 1 on postcard.

Tiering Truck Shown

Three models of the new riding type SpaceMaker electric tiering truck are explained in an illustrated 4-p. bulletin. This new tiering truck will tier 48x48 in. loads at right angles from a 6 ft aisle. Action photos show this space saving feature and suggest many applications. Complete specifications are discussed in detail, together with descriptions of many proven applications. *Lyon-Raymond Corp.*

For free copy check No. 2 on postcard.

Welded Piping Reference

In addition to data on the Midwest line of welding fittings, a 186-p. catalog recently published contains a 65-p. technical reference section for engineers of welded piping systems. Charts show physical properties and chemical analyses of various kinds of pipe and fittings. There are digests of more than 20 ASA and ASTM specifications covering pipe, fittings and flanges, with a discussion of code requirements for pressure piping. One section is devoted to tables on working pressures, stress values and pressure ratings. Charts are included for easy calculation of expansion, modulus of elasticity and flow of resistance of bends, valves and fittings. *Midwest Piping & Supply Co., Inc.*

For free copy check No. 3 on postcard.

Silicates for Industry

Properties and uses of soluble silicates in industry are presented in a new 16-p. pocket-size booklet. Analyses covering chemical characteristics, physical properties, alkali-silica ratio, degrees Baume, and basic advantages for 19 of the more popular silicates are given, along with factual information on the major classification of uses. *Philadelphia Quartz Co.*

For free copy check No. 4 on postcard.

New Fastener Samples

Assembly of the new Tufflok nut is shown on a sample card, to which is attached four samples of the nut for your inspection. The seven standard sizes available are illustrated on the card for ready reference. *Townsend Co.*

For free copy check No. 5 on postcard.

Ventilation Guide

Concise yet informative coverage of general industrial ventilation problems and their economical solution is provided in the new "Industrial Ventilation Guide." Points discussed include types of ventilation, system pressure, recommended air changes, duct resistance chart and calculation of resistance. The guide will prove of interest to anyone in the industrial field who wishes information on how to solve a particular ventilation problem. *Propeller Fan Mfrs. Assn.*

For free copy check No. 6 on postcard.

Injection Molding

Design features for ease and economy of operation of Fellows Speed-Flo injection molding machines are covered in a new 4-p. circular. Several models of this new high speed and capacity plastics molding equipment are shown and described. *Fellows Gear Shaper Co.*

For free copy check No. 7 on postcard.

Dust Collector

Cutaway drawings illustrate construction and operation of Bubar dust collectors in a new 4-p. folder. Flexibility, efficiency, draft loss, power requirements and maintenance for the equipment are discussed. *Bubar Dust Systems, Inc.*

For free copy check No. 8 on postcard.

Portable Grinders

The full line of Onsrud air turbine portable grinders are described and illustrated in a new

Turn to Page 110

USE THIS POST CARD

NEW

PRODUCTION IDEAS

New and improved production ideas, equipment, services and methods described here offer production economies. For price and other information, fill in the attached card and mail it.

Conveyer Control Centers

An automatic conveyer system for moving and mixing ores at a smelter can be controlled by remote pushbutton stations tied together through motor control centers. The conveyer system is divided into separate groups or operations that in turn are co-ordinated in proper sequence to insure a smooth flow of ore from one process to the next. Each remote pushbutton station is equipped with separate control outlets that are connected to the main control center one at a time. This interlocks the stations providing master control of conveyers, elevators, crushing rolls, feeders, and vibrators from any one of the numerous stations. The control center saves space and simplifies routine maintenance and inspection. *General Electric Co.*

For more data check No. 13 on postcard.

Hydraulic Drum Forks

Ordinary pallet fork operations, plus the handling of steel drums without pallets, can be accomplished with new hydraulic drum forks. The right-hand fork can be moved laterally by a double-acting hydraulic cylinder, while the left hand fork is anchored in a stationary position. To pick up two steel drums, the movable fork is shifted outward, the lift truck approaches the drums, allowing the forks to pass to either side and below the upper rolling rings of the drums. Concave notches on the inside edges of the forks make close contact with the sides of the drums when the movable fork is closed. Drums are picked up between the forks and supported by the rolling rings. *Towmotor Corp.*

For more data check No. 14 on postcard.

Sand Conditioner

Cutting, magnetic separation, screening, and piling of foundry molding sand are the operations handled by the new Sandmaster. The cutting cylinder not only cuts and mixes the sand, but imparts a mulling action, leaving the sand

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(Sec. 34,9 P.L.&R.)
New York, N. Y.

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THE IRON AGE
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NEW YORK 17, N. Y.

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NAME ..... TITLE.....

PLEASE STATE BUSINESS.....

COMPANY .....

CO. ADDRESS .....

CITY .....ZONE.....STATE.....

NEW PRODUCTION IDEAS

Continued

fluffy, aerated and cool. Synthetic sands are conditioned quickly and with less bond additions. The Sandmaster employs hydraulic steering and is easily maneuverable. It can be supplied in gas or electric drive with variable speeds of 4 to 25 fpm for cutting and screening, and 25 to 100 fpm when piling or traveling from floor to floor. *American Wheelabrator & Equipment Corp.*

For more data check No. 15 on postcard.

Electronic Recorder

A wider range of magnification in tension, compression and transverse testing is provided by a new electronic recorder. A single multiposition switch selects magnification of strain from 1000:1, 500:1, 250:1, 100:1, 50:1, 20:1, and 10:1 without gear changes. The testing machine operator can change from one magnification to another during the test without affecting the values of the test data. The new unit may be used with an extensometer or compressometer. The load scale is spread over 182 in. for each range. *Tinius Olsen Testing Machine Co.*

For more data check No. 16 on postcard.

Immersion Thermostat

The thermal element of a new thermostat for control of liquid and air temperatures comprises a metal tube and rod of different coefficient of expansion, securely bonded to each other at one end, the opposite end of the rod operating a switch mounted on a sturdy casting. Strain relief construction permits exposure of the instrument to extreme temperatures both below and above normal operating temperature, without affecting the calibration. The rating is 1500 w at 115-230 v ac non-inductive load. It can be supplied in adjustment ranges to operate at temperatures from −100° to +700°F. *George Ulanet Co.*

For more data check No. 17 on postcard.

Cleaning Solution

For cleaning personal safety equipment such as goggles, respirators and helmets, a new solution combines the properties of a germicide and detergent. This No. 101 Germicidal Detergent removes dirt and deposited skin oils without inducing corrosion, staining or deterioration of rubber, plastic, or metal parts. The solution may be used as a spray, swabbing or immersion solution. As a deodorant the fluid is effective in hot or cold water. *American Optical Co.*

For more data check No. 18 on postcard.

Speed Reducer

To serve fractional horsepower, small space requirements, a new double reduction speed reducer, designated Type DBRA, has been designed for various duties in the transmission of small power loads. Totally enclosed in a single piece, compact housing, the DBRA offers a range of 1/20 to ⅛ hp and reduction ratios of 25:1 to 1764:1. The unit is stocked in 24 different right angle drive assemblies. *Winfield H. Smith Corp.*

For more data check No. 19 on postcard.

Rust Inhibitor

A new rust inhibiting oil base paint serves as a rust preventive and finish coat in one application. It may be applied to damp surfaces as well as dry, and is said to penetrate rapidly through rusted surfaces instantly expelling moisture from beneath. Resistant to fumes, salt air and weather, No. 425 may be applied to new metal or that already rusted. It withstands dry heat up to 500°F. Several colors are available. *United Laboratories, Inc.*

For more data check No. 20 on postcard.

Aluminum Coating

Krylon aluminum is a flexible plastic coating said to have the sparkle of aluminum. It gives an opaque coating of aluminum, at the same time providing a sealing of plastic that resists moisture, light acids, dilute alcohols and other chemicals. Krylon alumi-

6/8/50

THE IRON AGE, New York 17, N. Y. **2**

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43	44	45	46	47	48	49	50	51	52	C1	C2	C3	C4

NAME ..... TITLE.....

PLEASE STATE BUSINESS.....

COMPANY .....

CO. ADDRESS .....

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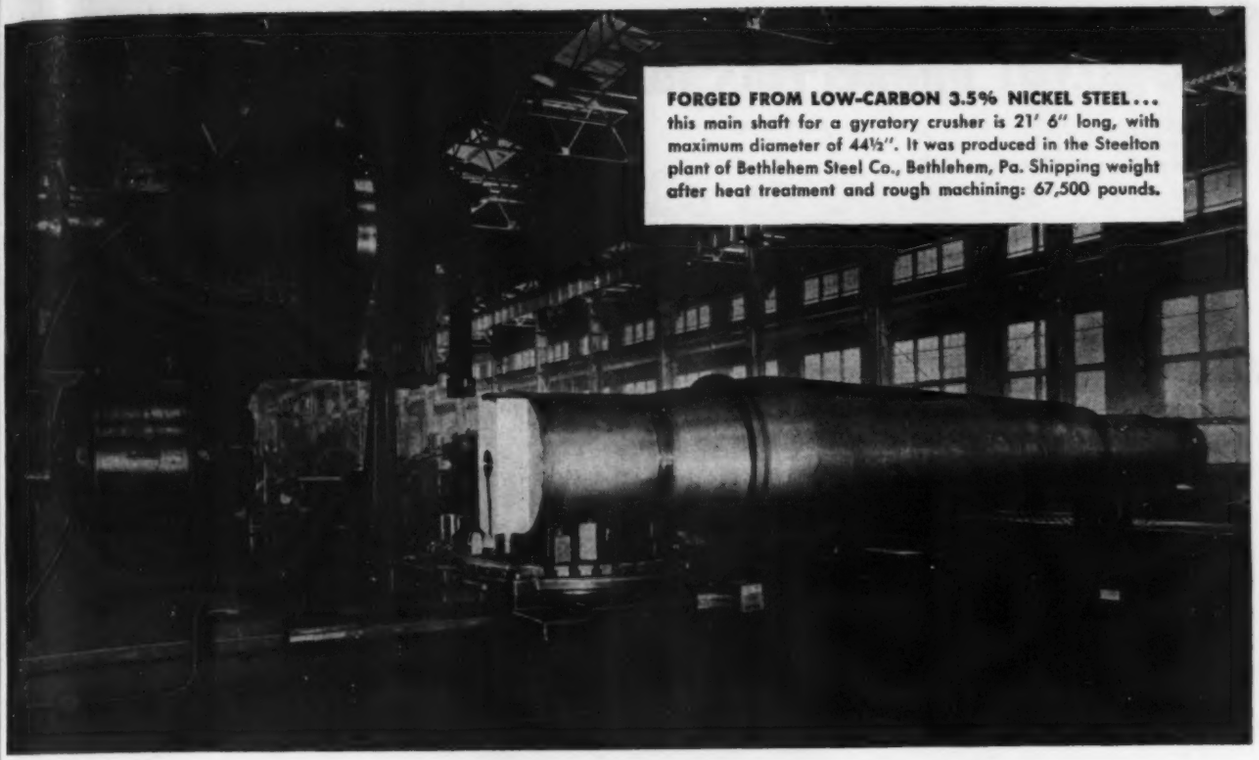


FORGED FROM LOW-CARBON 3.5% NICKEL STEEL... this main shaft for a gyratory crusher is 21' 6" long, with maximum diameter of 44½". It was produced in the Steelton plant of Bethlehem Steel Co., Bethlehem, Pa. Shipping weight after heat treatment and rough machining: 67,500 pounds.

how NICKEL assures

Superior Mechanical Properties

in heavy forgings...

Frequently, forgings are so large that only a limited portion of the mass can be worked under the hammer or press in one operation . . .

And even when dimensions permit liquid quenching, the section sizes ordinarily involved limit the cooling rates and, correspondingly, the response to heat treatment.

In large forgings, therefore, improved strength and elastic properties are much more dependent upon a judicious selection of alloy content than is the case with smaller sized articles.

That's why BETHLEHEM STEEL COMPANY produces many heavy forgings from nickel alloyed steels . . .

For nickel, either alone or in combination with other alloying elements, exerts several highly beneficial influences. Its strengthening effect on ferrite is independent of carbon content or heat treatment of the steel, while its effectiveness in reducing the rate and temperature of the upper transformation, induces a better response to the necessarily milder heat treatments used.

The forged shaft shown above, is an example. For some applications, and particularly when service temperatures are below 0°F., Bethlehem produces large forgings in 0.15% carbon, 3½% nickel steel. Shafts of this composition are giving excellent service in large gyratory crushers operating in northern United States and Canada.

Specify nickel alloy steels to assure peak performance of vital parts in *your* products or equipment. Send us the details of your problem for our suggestions. Write us now.

EMBLEM OF INCO SERVICE
TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the properties, treatment, fabrication and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes, nickel silver, cupro-nickel and other alloys containing nickel. This information is yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

NEW PRODUCTION IDEAS

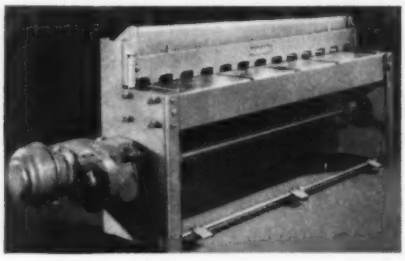
Continued

num takes 5 to 10 min to dry. It is packaged in an automatic spray dispenser. *Krylon, Inc.*

For more data check No. 21 on postcard, p. 35.

Power Squaring Shear

Economy and high output are claimed for a new line of power squaring shears that is fabricated completely from formed steel plates. Downtime is reduced by the use of four cutting edge knives, providing four new cutting edges between regrinds. Convenient gaging is assured by front gages, side squaring gages and by a precision ball bearing, self-measuring back gage that can be indexed on intervals of 1/128 in. increments.

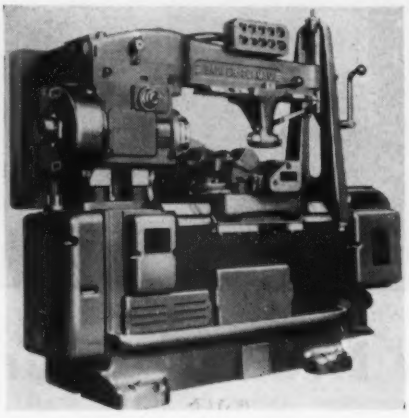


An electric foot switch can be furnished for remote control of the shear. The Niagara multiple jaw sleeve clutch has been incorporated in the machines providing instant engagement and positive drive. A new Hi-Power drive features a completely enclosed transmission in which all mechanisms including clutch, gearing, flywheel and detent operate continuously in a bath of oil. *Niagara Machine & Tool Works.*

For more data check No. 22 on postcard, p. 35.

Hobbing Machine

Improvements in the No. 16-16 gear hobbing machine provide closer control over finish and accuracy and increased job output and flexibility. An automatic hob-shifter is now available as extra equipment on the machine. It is of the mechanical type, electrically actuated to shift in increments of 0.0026 in. The shifter moves either forward or in reverse by changing a selector lever and automatically resets the hob in a new cutting position after each machine cycle. It is mounted on the machine integral with the hob slide, and is synchronized with the rapid traverse and main motors to reposi-

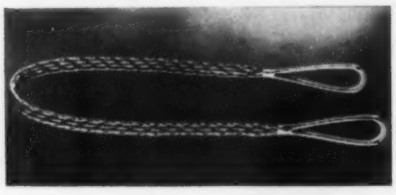


tion the hob. The machine bed incorporates one flat and one V way for greater accuracy and rigidity. All feed, index and differential change gears are identical in design, with 30° involute splined holes; only one full set of gears is required with each machine for universal operation. *Barber-Colman Co.*

For more data check No. 23 on postcard, p. 35.

Wire Rope Sling

A flat-braided wire rope sling provides a relatively wide, flat bearing surface with the sling thickness held to a minimum. It is fabricated from one endless wire rope, the sling ends terminating in

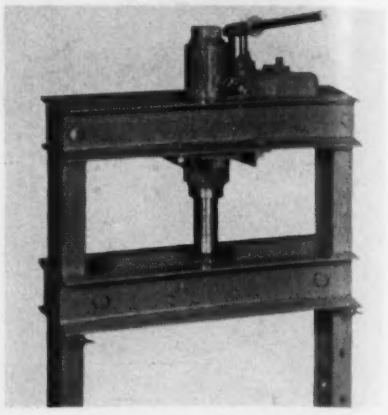


natural loops that are fitted with special Macwhyte cresent thimbles. The sling is used in a basket hitch with the sling encircling the load and the two loop eyes on the crane hook. It is made to order in the length and safe load capacity required. *Macwhyte Co.*

For more data check No. 24 on postcard, p. 35.

Hydraulic Press

A 5-ton capacity hydraulic press has a self-contained pressure unit that is removable from the frame and adaptable to many purposes.

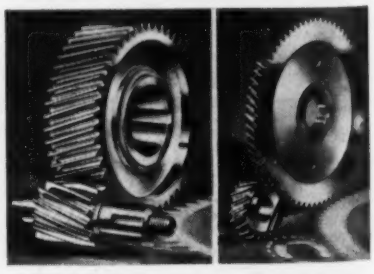


The press unit can be used in vertical or horizontal position, has daylight opening of 14½ in. for the bench model and 29½ in. for the floor model. Length of ram stroke is 5 in. The bolster is adjustable in 3 in. increments, with totals of 12 and 27 in. for the bench and floor models, respectively. A relief valve prevents overloading. The press is lightweight and can easily be transported from place to place. *C. R. Brandt Machine Co., Inc.*

For more data check No. 25 on postcard, p. 35.

Standardized Gear Sets

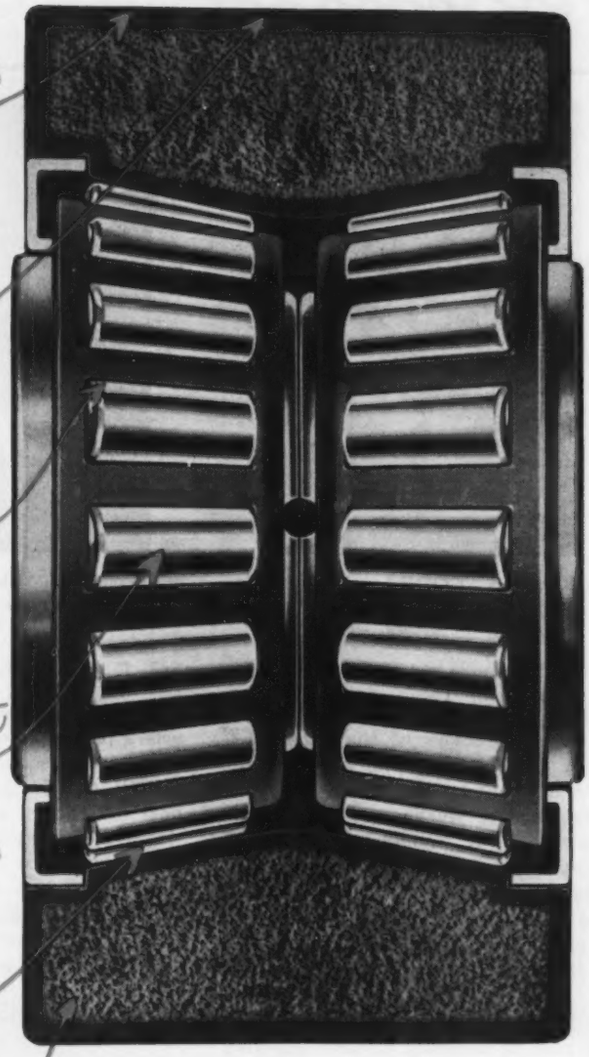
A new engineering service in standardized gear sets offers Duti-Rated gears that have been pre-



engineered for life expectancy and horsepower capacity. Data on these gear sets have been prepared in tabular form, making the procedure of selecting gears comparable to selecting antifriction bearings. The gears are available in approximately 200 combinations

Turn to Page 112

Less scuffing and scoring in sheet levellers, with TIMKEN® bearings as back-up rolls



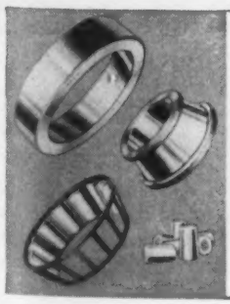
THE Timken® bearing shown here is especially designed to operate as a bearing and back-up roll, all in one! The outer race of the bearing itself forms the back-up roll.

With Timken bearings as back-up rolls in sheet levellers, marking of the sheets is reduced to a minimum. One reason is the almost complete absence of friction in Timken bearings. Timken bearings can be accelerated to top speed with minimum drag between rolls. This makes for less scuffing and scoring of the work rolls—less chance of marking the sheets.

Another non-marking feature of Timken bearings is their extremely smooth surface finish. Timken bearings for back-up rolls have a surface finish on the cup OD of 15 micro inches.

Timken bearings offer many other advantages for sheet levellers. Line contact between rollers and races gives them the extra capacity to take the leveller's tremendous radial loads. They permit tighter closures which retain lubricants better. They reduce wear on related parts. And they normally last the life of the machine.

Plan now to use Timken bearings as back-up rolls in your sheet levellers. For full information and engineering data on this application, write us on your company letterhead. And wherever you use tapered roller bearings, always insist on the trademark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



DESIGN LEADERSHIP

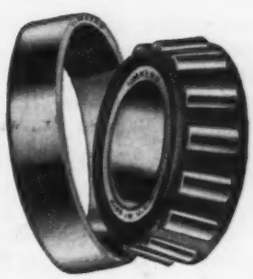
The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roll ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION ✳

Iron Age *Introduces*

J. H. DEVOR, assumes post of president, Wagner Electric Corp., St. Louis.

JOHN C. COTNER, newly appointed president, Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.

ELMER F. TWYMAN, elected vice-president in charge of Philadelphia division, Yale & Towne Mfg. Co.

Donald Knepper is the new superintendent of industrial relations at Worcester Works of AMERICAN STEEL & WIRE CO., while **John C. Scott** is superintendent of industrial relations and **C. D. Morrow**, supervisor of labor relations, at the Duluth Works.

Newton D. Baker III was elected president of HARRIS PRODUCTS CO., subsidiary of the CLEVELAND GRAPHITE BRONZE CO. He succeeds **Charles H. Bitzer**, who becomes chairman of the Harris board of directors.

John F. Gilligan, advertising manager of PHILCO CORP. since 1944, was named vice-president-advertising. Others appointed vice-presidents were **Henry T. Paiste, Jr., Raymond B. George** and **Walter H. Eichelberger. James M. Skinner, Jr.**, was made general sales manager of the refrigeration division.

C. L. Brockschmidt, Walter E. Caine, O. S. Carpenter, Mills Cox and **B. D. Goodrich** were chosen vice-presidents of TEXAS EASTERN TRANSMISSION CORP.

John N. Marshall, chairman of the board of directors of the GRANITE CITY STEEL CO., was re-elected to that office and also elected company president. As president, Mr. Marshall succeeds **N. B. Randolph** who retired because of ill health. **George B. Schierberg**, executive vice-president and secretary-treasurer, was elected to succeed Mr. Randolph as a member of the executive committee.

Charles J. Petry was appointed to the post of assistant division superintendent of AMERICAN STEEL & WIRE CO.'S South Works at Worcester, Mass.

C. A. Hulsemann has been appointed manager of industrial brake sales department, aviation products division, GOODYEAR TIRE & RUBBER CO.

Charles E. Kaufman, assistant director of research of HALL LABORATORIES, INC., has been named director of research. Mr. Kaufman succeeds **Dr. Everett P. Partridge**, whose appointment as director of Hall Laboratories was announced recently. (THE IRON AGE, May 25, p. 56.)

Herbert G. Austin is retiring from active participation in sales work. He has been associated with LUKENS STEEL CO. for 23 years and held the post of district manager of sales of the Boston office.

G. W. Snyder has been appointed combustion engineer of the Midland Works of CRUCIBLE STEEL CO., succeeding **M. H. Mawhinney**, who has been made combustion engineer for all Crucible plants.

Jerome Hernandez, employed by KAISER STEEL CORP. at the Sunnydale, Utah, coal mine, was awarded the medal of honor of the Joseph A. Holmes Safety Assn. for "knowingly risking his life" to save a fellow employee.

George E. Shafer has been appointed chief engineer of ARMCO DRAINAGE AND METAL PRODUCTS, INC. The change of organization was occasioned by the retirement of **Carleton C. Clark**, who has been manager of the fabricated products engineering department, and **John R. Wilks**, manager of new product development.

H. Ward Zimmer was elected executive vice-president of SYLVANIA ELECTRIC PRODUCTS INC. Mr. Zimmer, who has been vice-president in charge of operations for the past two-and-a-half years, joined Sylvania in 1919. He was elected to the board of directors last April.

Joseph W. Wieger was appointed chief product engineer for the MIDVALE CO., Philadelphia. Mr. Wieger has been with Midvale since 1939.

Gilman Y. Murray has been assigned to ALLIS-CHALMERS' Los Angeles district office as a sales representative. Assigned to the Charlotte district as sales representative was **John J. Greagan, Jr. Louis E. Lipphardt** has the same position in the Boston district office.

W. A. Steiger was appointed manager of WESTINGHOUSE ELECTRIC CORP.'S patent department. **G. M. Crawford** was made manager of the patent division at the East Pittsburgh plant and **William F. Kelly** manager of the patent division at the Bloomfield, N. J., plant.

Lee Hoban was named sales manager of the Kerrick Steam Kleaner Division of CLAYTON MFG. CO., El Monte, Calif.

E. A. Carpenter has been appointed Chicago district sales manager for FIRTH STERLING STEEL & CARBIDE CORP. **C. E. Hughes** was named district sales manager of the newly created southern district, with headquarters in Birmingham.

William H. Lyon was named to the post of supervisor of engineering and maintenance at the AMERICAN STEEL & WIRE CO.'S Trenton, N. J., Works.

E. C. MANIX, appointed general sales manager, Nichols Wire & Aluminum Co., Davenport, Iowa.

Iron Age Salutes

TADEUSZ SENDZIMIR

THE Galvanizers' Committee of the American Zinc Institute showed admirable judgment in awarding its first annual award to Tadeusz Sendzimir. An inscribed bronze plaque was given to Mr. Sendzimir at the Committee's twenty-third semi-annual meeting, held in Toronto, May 18 and 19, in recognition of his fundamental achievements in the galvanizing of steel sheets.

Inventor of the Sendzimir continuous galvanizing process, he is now vice-president of the Armzen Co. which was formed with the Armco Steel Corp. to further his inventions.

Armco, controlling patents granted to Mr. Sendzimir in 1938 and 1940, has been using this process for the past 14 years and last year installed a fourth unit for continuous zinc coating at Middletown, Ohio. At the same time, the process was offered to other steel companies under a license arrangement.

Two of the best known of his other inventions are the Sendzimir cold reduction mill and the Sendzimir planetary mill. The former rolls metals into mile-long strips that may be as thin as .001 in. The latter is a hot mill, still in the experimental stage, capable of reducing thick slabs into strip in a single pass.

Now an American citizen, Mr. Sendzimir was born in Lwow, Poland, in 1894 and graduated from the Polytechnical Institute there as a mechanical engineer in 1915. World War I saw him interned near Kiev, U.S.S.R., but he managed to escape through Siberia to Shanghai where he took up engineering again in the wire industry.

In 1930 he returned to Poland, continuing his work in the metal industry. Mr. Sendzimir was in this country at the outbreak of World War II and, being unable to return to Europe, continued his experiments here.

Working at a terrific pace, he amazes his associates with the amount he can accomplish in a given period of time. His secret is that he sets up more than he can do, thus eliminating the possibility of wasting any time.

His associates say of him, "When you're stuck, call on Tad. He'll find a solution even if he has to invent something to do it."

EDWARD C. SPETER, named supervisor of labor relations, American Steel & Wire Co.

THOMAS L. GERWIG, promoted to district sales manager, Philadelphia, for Republic Steel Corp.

EDMUND PFEIFER, becomes assistant district manager of sales, Boston, for Lukens Steel Co.

Edward Jones was appointed plant manager of the West Coast plant, NATIONAL SCREW & MFG. CO. OF CALIFORNIA.

J. H. Burrus, U. E. Sandelin and **Stephen C. Bacon** are new district office managers of the Milwaukee, Portland and Seattle offices, respectively, for ALLIS-CHALMERS.

Walter J. Barnes was named regional manager of the newly created southeastern region of NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh. Mr. Barnes has been manager of the company's Atlanta district sales office.

Robert T. Wood has been named chief metallurgist of magnesium products for ALUMINUM CO. OF AMERICA.

Albert E. Bickell was selected to fill the post of assistant district sales manager of GENERAL REFRACTORIES CO.'S Pittsburgh office. **George L. Peck**, who has been with the General Refractories Pittsburgh sales office since 1948, will replace Mr. Bickell in the Philadelphia office.

T. C. Fogarty, formerly vice-president in charge of sales, has been appointed executive vice-president — metal division, of CONTINENTAL CAN CO., INC. Promoted to the newly created posts of division vice-presidents are: **Reuben L. Perin**, eastern division; **William M. Cameron**, central division; and **Sherlock McKewen**, Pacific division. **Loren R. Dodson**, formerly assistant secretary and assistant treasurer, has been named secretary and treasurer. **Harry A. Rapelye** was promoted from vice-president to president of CONTINENTAL CAN CO., OF CANADA, LTD., a wholly-owned subsidiary.

Clarence H. Linder, formerly assistant to the general manager of GENERAL ELECTRIC CO.'S apparatus department, has been appointed manager of engineering and acting manager of manufacturing of the affiliated manufacturing companies' department.

Al Graebner has joined the FAHRALLOY CO., Harvey, Ill., as a sales engineer.

Donald L. Harwood was named purchasing agent of FAIRBANKS, MORSE & CO. Mr. Harwood began his one-company business career when he joined Fairbanks, Morse & Co. in 1926.

Carl F. Schnuck, becomes director of engineering and **Warren C. Whittum**, chief engineer, of FARREL-BIRMINGHAM CO., INC.

Gordon R. Anderson has been appointed to the position of general manager, Freeport Works, FAIRBANKS, MORSE & CO. Mr. Anderson succeeds **Lee Madden**, who has retired.

Mark A. Brown was elected to the board of directors of AMERICAN RADIATOR & STANDARD SANITARY CORP. to fill the vacancy caused by the death of **Robert B. Dickson.**

Paul C. Hurley, Jr., was appointed manager of PENNSYLVANIA SALT MFG. CO.'S newly-created sales promotion department.

Alfred J. LeBrun was made Connecticut sales engineering representative of the Lucas Division of NEW BRITAIN MACHINE CO., New Britain, Conn.

Lawrence J. Kline has been named general manager of the Automatic Transportation Co. Div., YALE & TOWNE MFG. CO. Mr. Kline succeeds **Elmer F. Twyman**, whose election as vice-president in charge of the Philadelphia division is reported in this issue of THE IRON AGE.

Joseph A. Walsh was made supervisor of engineering and maintenance at AMERICAN STEEL & WIRE CO.'S New Haven Works.

G. A. Dies has been appointed assistant to the sales manager, metal division, of NATIONAL LEAD CO.'S St. Louis branch.

R. R. Rolph becomes Detroit division sales manager of the Warner Gear Division of BORG-WARNER CORP.

OBITUARIES

Walter G. Robbins, president of Carboloy Co., Inc., Detroit, died May 18 in Schenectady. He was a founder and later president and chairman of the Cutting Tool Mfg.'s Assn.

Edward B. Heyden, 52, head of Graver Construction Co., and vice-president of Graver Tank & Mfg. Co., Inc., died at his home in Cranford, N. J., recently.

Charles Hart, former president of Inland Steel Co., Chicago, and retired owner-president of Delaware Steel Co., Chester, Pa., died May 23 after a long illness. He was 81.

William P. Hammersley, 74, builder of the first hard surface roads on Cape Cod and Martha's Vineyard, Mass., died May 21 at Harwichport, Mass.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Auto output sets another record during May . . . Contract clause on technical progress is GM milestone . . . Pensions may make partners of workers . . . Good spirits evident.

By WALTER G. PATTON

Rough on Records — Another all-time production record was established by the automobile industry during May. Preliminary estimates indicate May output of U. S. auto plants hit 700,000, surpassing the August 1949 record turnout of 661,740. Using a rough estimate of 1.7 tons gross of steel per vehicle, this means that nearly 1,200,000 tons of steel were required for new cars by the automobile industry during the month of May.

Crucial Clause—As some students see it, the biggest single forward step GM was able to take in its epoch-making 5-year contract is this clause: "The annual improvement factor provided herein recognizes that a continuing improvement in the standard of living of employees depends upon technological progress, better tools, methods, processes and equipment, and a cooperative attitude on the part of all parties in such progress. It further recognizes the principle that to produce more with the same amount of human effort is a sound economic and social objective." Many unions, it is argued, would never have agreed to such a clause in a 1-year labor contract.

Trend of Times—As the UAW-CIO pension ball rolls on toward the smaller firms in the auto industry several trends are evident: (1) all future pensions will be funded, (2) there will be few if any reductions in company liability based on future changes in social security, (3) benefits for employees who have worked *less* than 25 years are increasing, (4) vacations and insurance benefits are being broadened.

Bird in Hand—What happens to a non-organized company in an organized industry where pensions have been granted? Most observers agree that greater *immediate* employee satisfaction can be bought with the equivalent of the pension cost in the form of a straight wage boost.

However, if that company is later organized, it will, in all probability, have to meet the pension pattern, including past service requirements. Under these circumstances, many executives are taking the position that a pension today is better than a pension tomorrow.

Hand in Hand—By definition, an industrial optimist is an executive who believes much good can come from recent pension agreements. Here is one potent argument in favor of pensions: by agreeing to a pension, the workers have, in effect, made themselves partners in industry. The basis for this argument is that, if the business fails, the best the pensioner can hope for is the amount of his credit in the pension fund.

Because of pensions (also seniority) the workers' freedom of movement in U. S. industry is becoming more and more restricted. Therefore, he will have to do what he can to make the business profitable—just to make his own job more secure!

Convertibles Lose — Based on compilations by Ward's Report, during the first 4 months of

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2157 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

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SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

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Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

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SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

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this year, convertible model production dropped from 77,092 to 52,781. During the same period, total passenger car output jumped 20 pct.

Factory Education—Nowadays, businessmen look to big business as well as to big government for help. For instance, Chevrolet sales manager, W. E. Fish, has recently disclosed that factory-sponsored instruction has increased tremendously since the end of the war.

Chevrolet now has six major educational projects in progress. These include a course in management for dealers; a "Powerglide" automatic transmission course for mechanics; an accounting study for bookkeepers of dealerships; used car clinics; courses in radio and heavy duty truck demonstrations.

Plant Project — Up-and-coming Standard Steel Spring Company has made another contract with "one of the Big Three" to supply seat and back cushions and tubular seat frames for passenger cars assembled on the west coast.

The company has purchased a plant in Los Angeles comprising 110,000 square feet. Construction is already under way. Completion is set for August 1, and the plant will employ 350 persons.

And a Hush Fell—During the last minute preparations for a recent open house, W. H. Doerfner, general manager of the Saginaw Steering Gear Divisions of General Motors, stuck his head in a door during a meeting to ask what some of the employees thought of the arrangements that were being made. The answer that came back was a jolt—and quite unexpected: "I don't like this open house worth a damn," one employee growled. "It's going to make liars at home out of too many of us."

"Free" Tour—A rugged individualist himself, Doerfner believes in letting his plant visitors set their own pace. During the recent open house at Saginaw, no guides were provided. Signs with arrows suggested a route that could be followed by the visitors who were free to linger in any department as long as they cared to do so.

Each department was prominently identified. The name of the foreman was displayed so visitors could ask for him by name. Visitors were encouraged to ask all the questions they wanted to—and did so.

During the 3-day open house, more than 15,000 visitors walked through the two GM Steering Gear Plants at Saginaw. On the first day, the plants were open only to the families of the company's 2300 employees. Biggest attendance was on the last day when the rain came down by the bucketful for several hours.

Good Will Reigns—Reaction to the 5-year GM contract with the UAW-CIO has been good. The first feeling of GM workers was one of great relief that there would be no strike. Some GM divisions are reporting a remarkable spurt in the number of new cars being bought by employees.

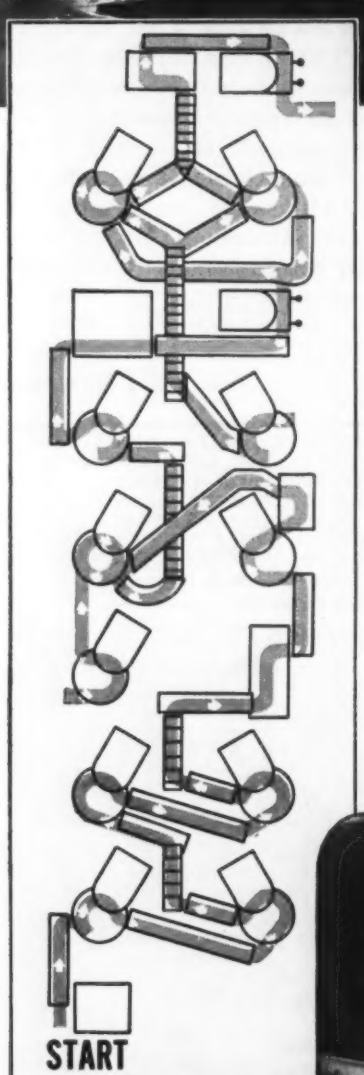
On the night preceding Memorial Day, stores in GM towns like Saginaw, for example, were unexpectedly jammed. Walking through the Saginaw Steering Gear plant last week one could hardly fail to sense the apparent good spirits of GM workers at their machines.

Contract Skepticism—The only criticism of the GM agreement heard here last week centered around two points: (1) the company and the union might not be able to keep the 5-year agreement and (2) the GM settlement sets too high a pattern for other companies to meet.

To this observer, criticizing an agreement because the contract *may* not be kept is like saying you don't like a man because some day he *may* go to jail. It can be argued, just as logically, that the GM contract actually sets a wage *ceiling* at a much lower level than some recent wage agreements. The union valuation of 19 cents per hour boost is generally believed to be on the high side.

THE BULL OF THE WOODS — By J. R. Williams

34-Piece Auto Latch Assemblies at 750 per hour with the *MULTIPRESS**



High-Speed presses with Indexing Tables and ingenious fixtures improve precision and eliminate lost motion on complex assembly job

A well-known maker of auto-door latches has knocked all of its previous production records into a cocked hat!

This complete multiple-step assembly line combines the fast, oil-smooth accuracy of Multipress with work-speeding, automatic Denison Indexing Tables in a closely integrated battery of thirteen cleverly tooled units.

Parts in process move from one Multipress to the next on chutes and conveyors. Operators simply place parts in the fixtures. Some tables move clockwise; others counter-clockwise–whichever brings parts closest to the next assembly stage. Handling is cut to the bone. Lost motion is eliminated. One, two, or three operators work at each Multipress, depending on what it takes to keep parts moving at a steady pace all along the line.

The plan at left shows the unique layout of this "all-Multipress" production line. The close-up below shows how parts bins are "ganged" around indexing tables to minimize operators' arm movements. Note also how operators' hands are always at a safe distance from the moving ram.

Controlled accuracy of the Multipress ram helps slash rejects on jobs like this. Multipress *compactness* permits close coupling of multiple operations without crowding. Index Tables *multiply* the rate at which parts can be fed to the press. More than likely, Multipress offers as much for some of your production jobs. It will pay you to check. No obligation. Write today.

Multipress is available in one to 35-ton capacities, with tooling, fixtures, accessories and attachments for an amazing range of requirements.

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WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT

Cold War in Scrap? — While prices of steel making grades of scrap on the Coast continue stable, both consumers and dealers are watching the changing market in the East and jockeying for position. Principal Coast buyers insist no price increases are in immediate prospect and point to heavy inventories and the freight differential of $23.07 per ton between Coast cities and Chicago markets as their protection.

However, some dealers are inclined to believe that neither bulwark will withstand effects of eastern assaults too long. Principal activity in the eastern scrap market revolves around No. 1 heavy, which is getting tight on the Coast, although No. 2 heavy is currntly selling at $18 and bundles are readily available.

One Explanation—Having been operating consistently at levels well above rated capacity, Kaiser Steel Corp. at Fontana in May again broke several production records: 107,817 tons of ingots (about 129 pct of rated capacity and 9 pct higher than previous all-time high record of December, 1949); 71,943 tons of rolled products produced with 68,177 tons shipped; and with production in the blooming and plate mills greater than ever before.

The two blast furnaces produced 65,602 tons of hot metal; Eagle Mountain Mines shipped in 87,415 tons of iron ore; the coke ovens produced 46,549 tons of coke; and the Kaiser Sunnyside coal mine in Utah shipped 85,660 tons which exceeded previous records by 21 pct and actually produced 111,420 tons.

West Is Tough—Gray iron foundrymen from the Los Angeles area who inspected equipment used for smog control in the East report that standards there are well below those of their own bailiwick and won't satisfy local ordinances.

These harassed foundrymen are requesting a new interpretation of the law which would limit particles moving into the atmosphere to .8 grains per cubic foot instead of the previous ruling of .4 grains.

Too Costly—In the requested hearing foundrymen will contend that to install electric precipitators or bag houses combined with coolers and selectors would cost the average small foundry $50,000 and put most of them out of business. They contend these costly methods are the only ones which will meet the present stiff regulations.

If their proposal is accepted by the smog control authorities they probably will sign contracts for wet scrubbers such as devised by Whiting Corp. costing the average foundry from $10,000 to $20,000.

Good and Bad—Coast manufacturers are jubilant that the Interstate Commerce Commission has decided no further rail rate increases on the Pacific Coast will be ordered. Water carriers, supported by the U. S. Maritime Commission, had charged that rail rates between California and Pacific Northwest's markets were unreasonably low and that the resulting competition was destroying the water service between Pacific Coast ports.

Manufacturers have contended that the high rates charged by water lines are attributable to unfavorable labor conditions and outmoded cargo handling methods and that to jack up rail rates to make even higher water rates competitive was unfair.

Steel Home—Approval of FHA for an all steel home is being sought in the Los Angeles area by the American Steel Home Co. which has built one model for demonstration and when in production will be fabricated by Consolidated Western Steel Co. and erected by Rand Construction Co.

The flexible unit will be fabricated in 8-ft sections with sheet metal exterior and interior walls. The houses are proposed on a class A construction basis and estimates are that they will cost "slightly more" than other good first class construction.

Soon to Cast—The $3,500,000 copper anode casting plant built by American Smelting & Refining Co. at Garfield, Utah, is expected to be completed in July and operate in conjunction with Kennecott Copper Corp.'s new electrolytic refinery, scheduled to get into the initial phase of operation in August.

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8-317

UNITED STATES STEEL

THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

By EUGENE J. HARDY

Lack of Capacity ? ? ? — The steel industry can expect new blasts from the Nation's Capital on lack of capacity. Administration advocates of greater expansion and Government mills have been given new ammunition as a result of heavy demand and resultant shortages. They have been quiet for more than a year, but are now beginning to drag out their oft-reiterated theories. Main argument now, in addition to tight market conditions, is that there could be a real boom if sufficient steel were available.

Steel Market Probe—First indication of this trend comes from the House Small Business Committee which is quietly investigating "general market conditions" in the steel industry. The investigation is based on complaints allegedly received by the Committee regarding the shortage in steel sheets, 20-gage and up.

The extent of the investigation is likely to depend on how much political capital the chairman of the committee, Rep. Patman, D., Tex., feels he can make by again taking up the cudgel against his number-one whipping boy.

The committee staff says that "the independent converter, fabricator and jobber of steel products is caught in the squeeze because of lack of sufficient rolling capacity to satisfy the present demand." Thus far, the staff has asked several Government agencies for data on steel market conditions.

Mine Subsidies Again — Mining state Congressmen are starting to use a new tack in their efforts to secure passage of subsidy legislation for domestic nonferrous mines.

They point out that the recently passed foreign aid bill with its Point Four provisions authorizing the spending of $35 million for technical assistance to underdeveloped areas specifically includes mineral development as one means of rendering technical aid. They ask, quite logically, why can't goose and gander both get some of the same sauce?

Scrap Exports Down — Rising scrap prices have lead to some wonderment on the part of a number of Congressmen as to whether increasing exports are partly to blame. Behind-the-scenes checking is underway. While Commerce Dept. export quotas have risen during the past year, they are still relatively small and indications are that the export market is dropping.

In the fourth quarter of 1949 the export quota was 80,000 tons, double that of the previous quarter. The first quarter 1950 quota was 100,000 tons. A second quarter quota had not been set early this week, but Commerce Dept. regulations permit licensing half the previous quarter's quota pending establishment of a firm figure.

The 50,000 ton maximum non-quota tonnage had not yet been taken up. The final quota is likely to be 100,000 tons, perhaps a little more. But with no overwhelming demand for licenses, Commerce officials are not concerned.

FTC Changes Nil—The Federal Trade Commission put into effect last Thursday an internal reorganization setting up new bureaus and naming "new" individuals to head these new offices. Its main purposes were to eliminate delay and duplications, and to promote co-operation with industry.

It may speed things up, but it's still the same old faces and the same old economic philosophy which spawned such things as strict f. o. b. mill pricing, implied conspiracy, and a general policy of keeping business on the hook with chaos as the ultimate aim.

Steel Good Example — An illustration of the FTC rut can be gleaned from recent events affecting the basing point charges pending against the steel industry. This case was handled by the FTC trial counsel in a fair, judicial manner.

In about two years from its inception, he brought to the commission a proposed consent order, agreed to by the industry. The commission has not acted on the order, but is expected to reject it. A majority of the staff worked hard and long to bring about rejection.

Acceptance would bring to a halt the blood-letting which dominant members of the staff visualized running on for many years. They now want the case re-opened.

New Life — The trial counsel's reward for trying to negotiate was being pushed into the background and having the case taken over by a division chief—a leader in the dominant clique.

Mr. Mason, while acting chairman, tried to breathe new life into FTC. He made some progress. Perhaps newly - appointed chairman, James M. Mead, with additional powers under the President's reorganization plan, can bring the staff more into line with the American way of doing business.

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Armco Takes Wraps Off Sendzimir Galvanizing Process

By K. OGANOWSKI
Associate Director, Research Labs.,
Armco Steel Corp., Middletown, Ohio

Sendzimir continuous galvanizing process substitutes oxidation and reduction for pickling, requires no flux in zinc bath. Stressing accurate control, the process yields a highly uniform product with a coating of tenacious adherence.

THE methods of application of zinc to iron and steel surfaces have been steadily improved and a gradual mechanization of the equipment has taken place. However until 1936, the basic steps of the galvanizing procedure remained unchanged. These consisted of cleaning of the surface of the material to be coated by pickling, fluxing the surface to promote wetting by molten zinc, and preheating the material in the molten zinc bath to a coating temperature.

With the use of cold-rolled steel as a base metal for galvanized sheets, the steps of removal of rolling lubricants by alkali cleaning, and annealing of the metal before coating were added.

Mr. Oganowski worked with Tadeuz Sendzimir in developing this process and has been associated with Armco during its perfection and improvement. This is an abstract of a paper presented at Toronto May 18 before the semiannual meeting of the Galvanizers Committee of the American Zinc Institute. The process is being disclosed because Armco has opened it for license to other steel companies. It is protected under U. S. Patents 2,110,893 and 2,197,622.

Surface preparation of the base metal, temperature control during the coating operation, and composition of the spelter bath are the major factors affecting the manufacture of galvanized products. If these factors are simultaneously controlled at the optimum of their range of variation, a coated product of very high quality can be produced consistently.

But despite numerous improvements in cleaning, pickling, fluxing and heating of the zinc kettles for many years there was no major development toward simplification of the basically complex operations of galvanizing or maintaining the consistency of these operations.

Continuous coating lines were developed, which combined chemical surface preparation of the previously heat-treated and temper rolled material with fluxing and coating, in one continuous succession of individual treatments. However, metal treated by a continuous chemical process such as pickling or fluxing is subject to a continuously changing set of conditions. The composition of solution, rate of reaction, products of reaction, and resid-

ual deposits on the surface change with every foot of passing strip, and the hazard of inconsistency is increased as more wet chemical treatments are added. It becomes necessary to use additives such as inhibiting, wetting, frothing and sequestering agents.

In 1936, the first continuous zinc coating unit incorporating basic improvements and unusual new features was installed by Armco Steel Corp. This unit, based on the Sendzimir coating process, stimulated development in continuous zinc coating which has revolutionized much of the galvanizing industry.

Process Was Radical Change

The Sendzimir process embraces a radical departure from conventional practice, specifying a set of conditions under which control of the primary factors of surface preparation, coating temperature, and bath composition, can be readily and accurately controlled.

In the Sendzimir process, surface preparation of the base metal is accomplished in two steps: Oxidation of the surface, and subsequent reduction of this oxidized surface. Though chemical means can be used to accomplish oxidation, the preferred method is heating in an oxidizing medium.

Oxidation by heating makes it possible to remove rolling lubricants and other combustible material, and at the same time provides a surface having the same degree of oxidation regardless of variations in the cleanliness of the metal. This is possible because the products of the cleaning reaction are gaseous, and the degree of oxidation obtained is dependent on only one readily controllable factor — temperature.

In the reduction of the oxidized surface, the reaction products are also gaseous, and the quality of the operation is controlled by the composition of the atmosphere and the furnace temperature, both easily regulated. Stable operation and consistent results are obtained because of the uniformity of the metal surface from the previous oxidizing step. A certain degree of desulfurization and decarburization of the surface also occurs during the reducing operation.

Economy suggests the combining of surface preparation steps with heat treatment of the base metal. Therefore, the full-hard, cold-reduced material generally used in the Sendzimir process is annealed at the same time as the oxidized surface is being reduced. Any heating and cooling cycle practical for continuous operation can be used, so long as the metal reaches the zinc bath at the proper temperature for instantaneous wetting and bonding with the zinc.

In the coating bath, the major problem of composition is the suppression of the formation of brittle iron-zinc compounds in the coating. The presence of these alloys would be detrimental to the ductility of the coating.

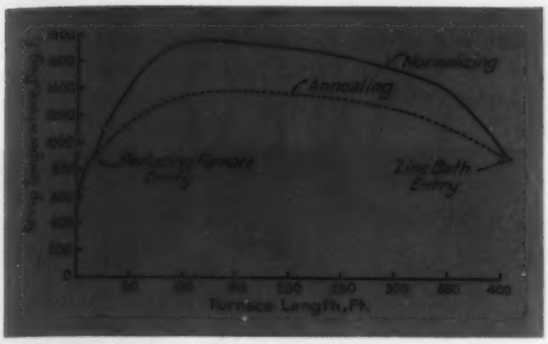
The rate of formation of these alloys is controlled by the addition of aluminum to the zinc bath and by the temperature of the material being coated. The aluminum content of the bath can be readily controlled because the method of surface preparation used makes the use of flux unnecessary. In ordinary galvanizing processes, the desired amount of aluminum cannot readily be retained in the bath due to the reaction of aluminum with the flux.

Ease of Control Sought

Equipment used in the Sendzimir process is selected and arranged to take full advantage of the ease of precise control under continuous operating conditions.

Equipment on the feeding end must uncoil

OXIDIZING FURNACE in foreground. In front of the furnace (at right) are the feeding pinch rolls and strip tension device. Beyond the oxidizing furnace (at left) is the reducing furnace.



HEATING CURVES for the normalizing and annealing cycles.

incoming strip and feed it into the coating line at a designated constant speed under specified tension, and provide for enough looping capacity to allow coil joining operations without affecting the speed of the unit.

Generally, this equipment consists of one or two pay-off reels, auxiliary pinch rolls which manipulate the ends of the two coils during the joining operation, a shear, a welding unit, a looper, a tension device, and main feeding pinch rolls.

The tension device must regulate the tension of the strip in the furnace according to variation in thickness and width of the strip. Tension must be sufficient to guide the strip through the various components of the complete coating unit but not so great as to stretch or break the strip in the furnace.

The preheating furnace must preheat the strip uniformly to a designated temperature. It is desirable to equip the furnace with an adjustable firing pattern so that uniform oxidation over the width of the strip can be obtained for all widths. A wide variety of industrial furnaces of suitable construction is available. High temperature, direct-firing gas burners have been found to be well suited for this furnace, because they give maximum energy release per unit hearth area.

The annealing furnace, placed in line with the preheating furnace, must complete heating the strip under a reducing atmosphere to the annealing temperature. The need for closely controlled atmosphere compositions makes necessary specially designed furnace elements such as the entry door, shell, brick work, and hearth conveyer. Open flame burners should not be used.

Furnace Controls Cooling Rate

The cooling furnace is directly connected to the annealing furnace and extends to the zinc bath with its end sealed by molten zinc. The purpose of this furnace is to control the rate of cooling of the strip in a non-oxidizing atmosphere.

Since the rate of production is variable with the width of the strip, the quantity of heat to be dissipated is also variable. The cooling furnace must be equipped with automatic heating and cooling means to compensate for these differences so that the temperature of the strip on entering the zinc bath is essentially constant regardless of the width of strip.

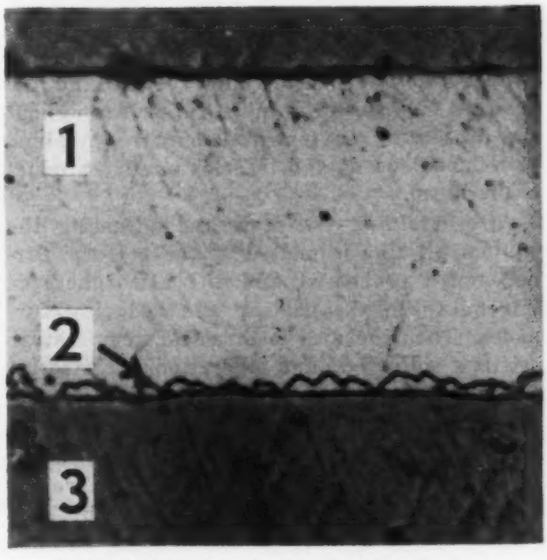
Any air infiltration in the final section of the cooling furnace would reoxidize the strip and spoil its wetting characteristics. Therefore special precautions must be taken in the design and construction of this section to avoid this hazard. Complete elimination of hearth roll outboard bearings in the final part of the cooling furnace has been found to be mandatory.

The pot furnace, which surrounds the zinc bath, must supply heat for initial melting of the zinc and also heat for maintenance of a uniform zinc temperature during normal operating conditions, though under operating conditions most of the heat required for heating and melting of the zinc and for radiation losses is supplied by the incoming strip. The inherent uniformity of heating and the low investment cost of an electric furnace make it most suitable for this application.

As this process does not require heating the strip in the bath or any specified time of immersion for wetting and bonding, the pot can be relatively small. It must, however, contain strip-guiding and finishing equipment and also must have space for accumulation of dross. The very slow rate of dross formation in this process makes drossing necessary only every 10 to 12 weeks.

Since aluminum is present in the molten spelter and only low rate of heat transfer through the pot walls is required, ingot iron or fire box steel offers a greatly increased pot life in this service as compared with ordinary galvanizing operations.

A submerged idling roll is generally used for



MICROSTRUCTURE of the Zincgrip coating produced by the process. The numbers show: (1) The zinc coating; (2) zinc-iron alloy; and (3) the base metal.

guiding the strip through the zinc bath. A suitable scraping device prevents excessive and non-uniform buildup of iron-zinc alloy on the surface of this roll.

Exit rolls, common to the sheet galvanizing operation, serve as a means of regulating the weight and uniformity of the coating. No flux is required on the surface of the bath to maintain a bright and uniform coating on the rolls. A mechanical scraping device is attached to the exit rolls to prevent deposition of oxide and dross on the surface of the coated strip. Service life of the exit rolls between redressings is 10 to 12 days.

The essential components of the delivery end are typical of all continuous strip processing lines handling annealed steel strip. The main set of pinch rolls, which establishes the coating speed of the line, pulls the strip through the furnaces and pot equipment. The speed of this set is changed with the changes in the gage of the strip.

All other drives on the line are either synchronized with the main pinch rolls or separated from it by looping devices. Thus all stops, slowdowns, and speedups required by the coil changing manipulation on the feeding and delivery ends can be performed without affecting the speed of the main pinch rolls.

Roller leveling, oiling, rejection separation, stenciling, coiling, and shearing equipment are generally incorporated in the unit. Bonderizing and slitting are done separately.

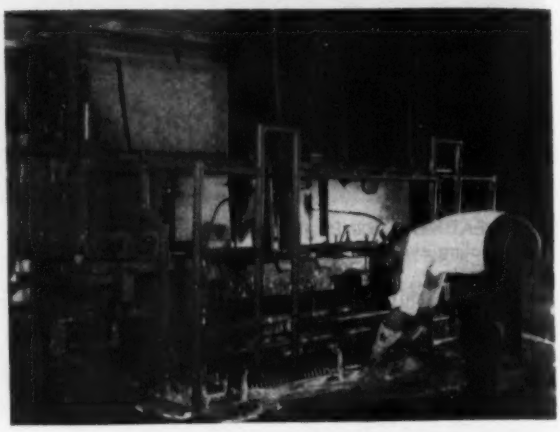
Unit Must Run at Full Speed

It is not practical to start this type of process slowly or operate at reduced speed while the operators are acquiring the necessary training and the equipment is being synchronized. Proper rates of heating and cooling and the desired balance of temperatures throughout the processing equipment cannot be obtained at reduced speeds and inferior quality product is produced.

After training the crew and adjusting the equipment, zinc is melted in the pot, the furnaces are preheated and the atmosphere is introduced in the cooling and reducing furnaces. Then the unit is threaded, temperature settings adjusted, and operations started at full rated speed. The same procedure is employed after drossing or complete shutdowns.

The line speed is changed according to the thickness of the strip so that a constant weight per hour is produced for a given width. Tension of the strip between the feeding and the main pinch rolls is adjusted for variations in the width and thickness of the strip.

Operation of the oxidizing furnace is controlled to produce strip temperature at the exit end of the furnace in the range of 750° to 850°F. The firing pattern of the furnace is adjusted for strip widths to insure uniformity of surface oxidation across the width of the material.



ZINC POT. The worker is adding zinc to the pot. The structure at the left is the exit end of the cooling furnace.

Either normalizing or subcritical annealing cycles can be used in the process. However, somewhat better and more uniform physical properties of the base metal can be obtained when a normalizing cycle is used.

The temperature of the zinc bath is maintained in the range of 850° to 860°F. Fluctuation of the zinc temperature must be avoided. Increased temperature causes greater solution of iron in the zinc; then when the bath temperature lowers the iron comes out as a fine dross in the coating.

Limitations of the process are obvious. Because of handling problems, it is not readily adaptable for coating cut length sheets and formed articles. Neither is it very satisfactory for coating highly alloyed materials containing large amounts of materials, such as chromium, which have oxides that are difficult to reduce. Severely scaled steel or surfaces carrying compounds not readily volatilized or burned at annealing temperatures, such as some wire-drawing compounds, cannot be coated without additional pretreatment.

The accurately controlled continuous annealing and coating results in a remarkable product uniformity, especially in mechanical properties of the base metal and in weight, distribution, adherence and ductility of the zinc coating.

The unusual adherence and ductility of the coating result from the elimination of the most brittle iron-zinc alloys and the restriction of formation of the less brittle of such alloys. Adherence of the coating produced by this process is sufficient to withstand, without peeling, drawing and forming operations to the limit of the drawing ability of the base metal.

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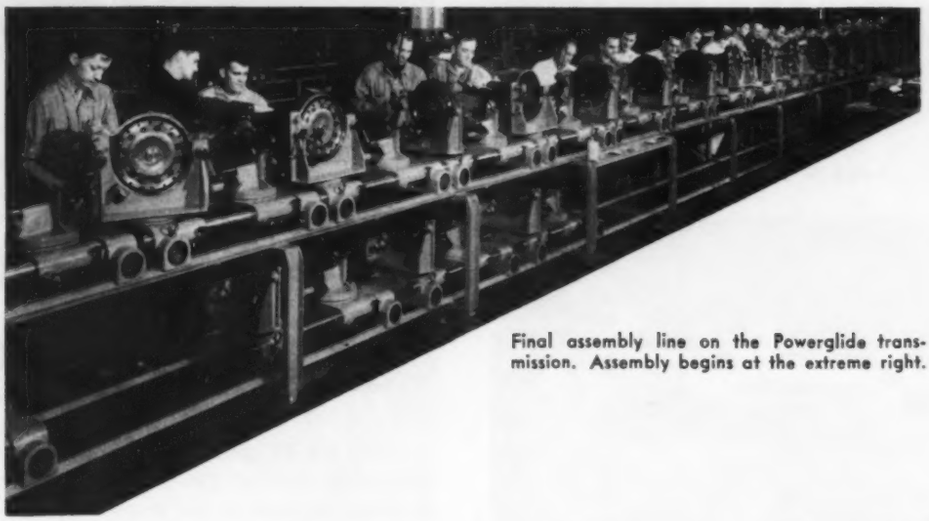
HOW CHEVROLET MACHINES ITS NEW TRANSMISSION



Final assembly line on the Powerglide transmission. Assembly begins at the extreme right.

Because the valve body of the Powerglide transmission handles oil under pressure, it must be machined to exceedingly fine limits. Standard equipment is used for this work. The torque converter and other parts are also machined here and are assembled in an air-conditioned area. This is the second part of a two-part article.

THE valve body carries the two valves that open and close the oil channels in the hydraulic system of the transmission. Every one of the 18 operations on this valve housing is held to within exceedingly fine limits. The two valve holes are held within a maximum of 0.005 in. and must be both round and straight. To obtain this result, the final precision bore is made with a tiny single-point tool mounted on a spindle supported at both ends. The final bore is preceded by a special preparatory lapping process on the body face. The lapping operation is to insure a perfect oil seal and to obtain a precision surface from which to locate for the final boring operation.

The first section of this two-part article described the use of standard and special transfer type equipment in machining the bell housing and the transmission case, the two largest parts of the transmission.

The machining operations are done on standard equipment. The front face is milled on a Newton 30-in. rotary table machine, and ground on a 36 x 1 x 10-in. Gardner grinding machine. Holes are drilled, reamed, and chamfered on an Allen 4-spindle machine. On an 8-spindle Bullard equipped with eight spindles and 16 locating pins, the rear face is rough and semifinished; the rear hub is turned; holes are core drilled, bored, counterbored, and chamfered; a 3/16-in. groove and neck is semifinished; cored holes are finished except the 1.001-in. reamed hole; and the rear face is semifinished.

A Kent-Owens mill is used to mill the valve body to case gasket face. All normal holes and three angular holes are drilled in a 6-station Ex-Cell-O right and left drilling machine. Tolerances range from 0.002 to 0.015 in. The manual valve hole and pressure regulating valve hole are

drilled and reamed on an Ex-Cell-O equipped with a multi-spindle head and a 2-spindle head. After drilling, the part is plug gaged to tolerances from 0.002 to 0.020 in.

The accumulator hole is rough bored, one angular hole is tapped, and the snap ring groove is cut by a Kingsbury 8-spindle Auto-Index drilling and tapping machine. The front face of the valve body is machined lapped in a Crane 48-in. Lapmaster, see Fig. 7. When finished, the surface must be sufficiently flat to give a 90 pct sealing contact on all lands, and must be free from scratches. It is in the machine 8 min.

A Heald single end, 2-station Bore-Matic is used to precision bore the hub ID to 1.000 to 1.002 in. Next, the hub OD is finish turned to 1.746-in. diam. After this, the OD of the large hub is finish turned to 1.978 in. and the small hub is chamfered to a 15° angle. The rear end of the large hub is then finish faced, and two snap ring grooves are turned. The manual valve hole, the accumulator hole, and the two pressure regulating valve holes, 0.500 and 0.640-in. diam, are semi-finished and then finish bored in an Ex-Cell-O Jr. single-end boring machine. A Norton Cam-O-Lap using a 120-grit belt, 1-in. wide is used to lap the OD on the manual valve hole hub. The manual valve ID is honed on a Hone Engineering Service vertical hone to 0.0005 in.

FIG. 7—The intricately cored valve body spends 8 min on this Crane Lapmaster. Finish must give 90 pct sealing contact on all lands and be free from scratches.

FIG. 8—Air gages inspect holes in valve bodies. Scale of the gage on the left is 0.0001 in., while that on the right reads to 0.00005 in. Limits on both valve holes are plus 0.0000, minus 0.0005 in.

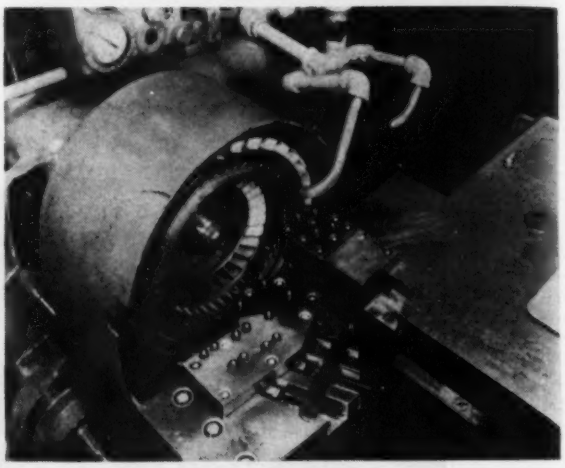


FIG. 9—Machining turbine and over-run coupling assembly. Excess stock is faced from the inner and outer shells. There are six tools on the left-hand head and two on the right.

After the 18 operations are performed on the valve body casting, the critical dimensions of the part are checked at the inspection station shown in Fig. 8. The scale of the air gage on the left is 0.0001 in.; that on the right is 0.00005 in. This gage is used to check the two valve holes. Limits on both valve holes are +0.0000 —0.0005.

Both front and rear pump bodies receive the same close attention to precision finish. Their faces are lapped in the same manner. Precision operations are applied to both the turning and boring of the outside and inside diameters and to the chamfering of the holes. These operations are done on 3-spindle machines, chucking only once in order to maintain correct relationship of dimensions. The two outer spindles finish the inside diameter and the face, while the center spindle finishes the bore and the face.

Converter Comes from Flint

In the case of the torque converter parts, the production of which was described in two previous articles, "Chevrolet Adopts a New Torque Transmission," THE IRON AGE, Mar. 16 and Mar. 23, all assemblies are delivered to Cleveland by the Chevrolet-Flint Mfg. Div. These parts require machining operations to remove the excess metal that was left on at the Flint plant for stable brazing operations.

It is also necessary to precision bore and face the mating parts for final assembly. All machining processes are based on the assumption

that the faces of the vanes should not be machined in any manner, both to avoid distortion of the vanes and to eliminate any need for burr removal. For this reason the housings, not the vanes, were designed to take the machining adjustments.

A typical converter part is the brazed primary pump assembly. This part, a complete subassembly welded into a heavy pressed metal housing, is chucked on the face of the vanes and on the outside diameter of the housing. Tools enter from the rear in eight successive operations to: (1) Face the inner and outer shells; (2) to bore the hole for the hub; and (3) to back face for the primary pump hub. Because of the hydraulics involved, these dimensions must be of the closest accuracy, and their limits must be held to a minimum. The same procedure applies to the other four vaned members of the torque converter. The turbine and overrun coupling assembly must be finish machined before final assembly, see Fig. 9. The operations involve facing excess stock from inner and outer shells, and finishing the rear flange face. The left-hand head holds six tools, the right-hand head holds two.

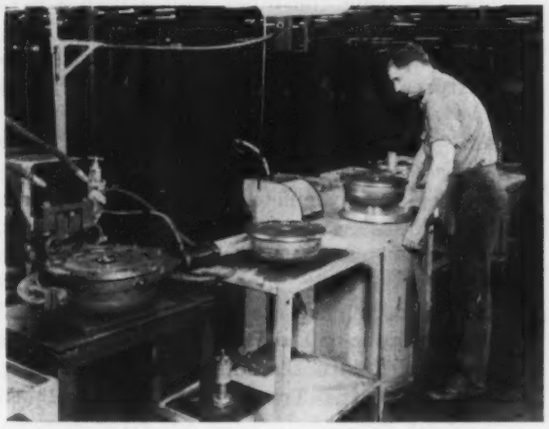


FIG. 10—Primary pump and housing assemblies are both statically and dynamically balanced with the flywheel cover installed. At left, weights are spotwelded to the housing to secure ¼ oz-in. balance in static test.

The primary pump and the turbine, the two larger converter members, are both statically and dynamically balanced to insure freedom from vibration. Fig. 10 shows balancing of primary pump and housing subassembly. The primary pump cover has been installed and the unit filled with oil. Weights are spotwelded to the housing, as shown in Fig. 10, to obtain the required ¼-in.-oz balance. Later the entire assembly is balanced.

Precision Boring on Planet Carrier

The planet carrier unit consists of a pressed metal body, a forged output shaft, a large parking lock gear, and six planetary pinions. Two sets of three short pinions and three long planetary pinions comprise the gear set. These gears are used for emergency low and reverse speeds.

FIG. 11—At a subassembly station in the final assembly room the planetary pinions are put into the planet carrier. Pinions are equipped with needle bearings. A formed plate washer holds them in place.

Their assembly into the planet carrier unit is shown in Fig. 11. Each pinion, filled with needle bearings is slid into position in the carrier. Pins that serve as axles are installed and locked into place by means of formed plate washers.

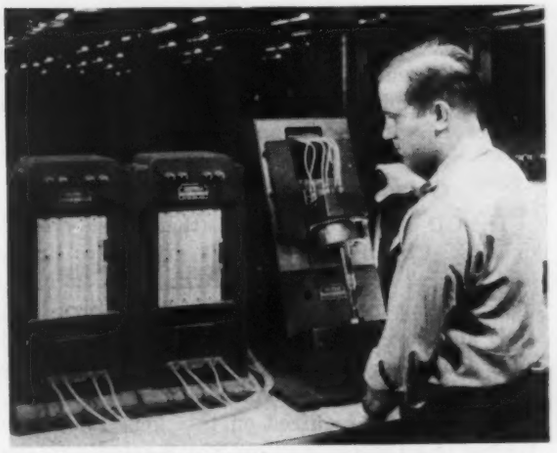


FIG. 12—Gaging the planet carrier on special air gages. Left-hand gage shows radial parallelism of the pinion pins. The other shows circumferential location of the six holes.

In a previous assembly, the output shaft is inserted through and fastened to the back end of the drawn metal body. Next the parking lock gear is fastened to the front or open flanged end of the body. The lock gear is approximately 3½ in. from the back of the unit. Both the output shaft and the parking lock gear are fastened to

the pressed housing by rivets. The six holes necessary for the planetary pinions are bored and line reamed through both the front and back faces on a Snyder double-end, 4-station, Auto-Index trunnion machine. Three sets of holes are slightly smaller than the other three, and are on closer centers.

The holes are bored on an Ex-Cell-O precision boring machine two pairs at a time with three indexes of the machine. Following the boring operations, the holes are inspected on special air gages, see Fig. 12. Gage spindles are lowered through the holes, front and back, to insure that: (1) Parallelism is within 0.00025 in., (2) center distance is correct to within 0.00025 in., and (3) concentricity with the center line is within 0.0005 in.

The extensive tooling used in manufacturing the gear set is brought to light by a follow-through of the operations on a typical part, the long planetary pinion: A 2-in. length of bar stock is semifinished, turned, bored, and cut off on a 6-spindle National Acme Automatic screw machine. The part is loaded into station 6, rough formed all over, broken down for cutoff, and spot drilled. At station 1, the part is finish formed, partly cut off, and a 43/64-in. hole is drilled part way. At station 2, the 43/64-in. hole is drilled further while a 1-in. diam shoulder is formed on both ends. At station 3, the 43/64-in. hole is continued and the end is finish faced and cut off part way. At station 4, the 43/64-in. hole is drilled through while the finish facing continues. At station 5, the machine is accelerated, the hole reamed to 0.680 to 0.684-in. diam, the end finish faced, and the part completely cut off. The OD, ID and overall length are gaged with profile and snap gages.

Grinder Works to Close Limits

The OD of the gear blank is then finish ground on a #2 Cincinnati centerless grinder to limits of 1.323 to 1.324 in. A New Britain No. 26 Newmatic boring machine is used to finish turn both ends and bore the ID. The hole is green honed on a double-spindle, vertical Micro-Hone and the ID air gaged on a Micromatic air gage.

The 18 teeth required on this gear blank are hobbed in a Cleveland model 220, 8-spindle rotary hobber. Two oil holes are drilled in a Cleveland-Republic 2-way driller. Care is taken so that the drill does not touch the sides of the teeth. Hole size is 0.0615 to 0.0655-in. diam. The 18 teeth are shaved in a Red Ring shaving machine. Dimensions over 0.1094-in. diam pins are 1.345 to 1.346 in. Chordal tooth thickness after shaving is 0.1083 to 0.1102 in.

Heat treatment of the pinion is done in a Holcroft furnace. The part is carbo-nitrided to obtain a 0.007 to 0.010-in. depth of case at a temperature of 1500° to 1550°F, and is then oil quenched and drawn at 450° to 480°F. The hardness is RA 80, minimum, with a core hardness at base of tooth of Rc 49 to 54. There is a minimum depth of 0.002 in. martensite in the bore after honing.

The oil grooves are ground in a Heald 25A rotary grinder and the pinion gears are then burred in a tumble barrel. Gear ends are later ground and the ends of the teeth brushed in a Hoern & Dilts GH-8 vertical honer. The hole is finished honed in the Micro-Matic H7-705-2, double-spindle, vertical Hydro-Honer. The part is then air gaged to ID limits of 0.6973 to 0.6978 in. The finished pinion is brought to final inspection and checked overall. The pitch diameter is checked by plug and pin gages. The part is also checked by the Red Ring gear checker.

Assembly Area Air Conditioned

The assembly room is enclosed and furnished with filtered air. The air is under pressure to prevent the entrance of any dust through the doors. The room is divided into three sections: Subassembly stations are along one side; the final assembly line is in the center; the test machines are along the other wall. There are 12 subassembly stations.

The final assembly line is equipped with special fixtures so arranged that the converter parts can be assembled into the bell housing in one section, and the transmission parts into the transmission case in the other. After these subassemblies are completed, the two units are joined. Assembly begins at the extreme right. The fixtures that support each subassembly can be rotated on their pivots. Mated cases and housings ride in separate fixtures, each mounted in its own frame on the fixture. Component parts are assembled into the units as their fixtures move to the left. Transmission case and bell housing are joined before the converter elements are installed. A worm gear operated by a handwheel is used to bring the two sections together for bolting. The end of the line is outside the picture to the left. When completed, the assembly is lifted off the fixture and transferred to one of the nine test machines. Empty fixtures are returned to the start of the line by a chain drive and track arrangement under the lines.

At the test area, the unit is mounted on one of nine test machines. Here, eight hoses are connected to the test plug holes. The transmission is driven by an electric motor and is tested under all operating conditions. It is also tested for silent operation. Each of the round dials at the top of the panel is equipped with two needles that show pressures under various operating conditions. The square dials at the left, below, show torque and rpm at the engine end of the transmission. Those at the right show the same at the axle end. The round dial in the lower center indicates vacuum. When the tests are completed, the accepted torque transmission units are ready for painting and shipping.

How to Specify

DIECASTING DIMENSIONS

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Proper diecasting dimensioning produces drawings that are easily understood in the shop. Errors can be avoided. Parts can be produced to high accuracy, strength, and surface finish. Scrap can be reduced, metal economy achieved.

A THOROUGH knowledge of the steps involved in building casting dies from blueprint instructions helps engineers develop sensible dimensioning practices. Properly dimensioned casting drawings give clear, concise manufacturing instructions to the die maker. This kind of instruction avoids misunderstandings between engineering and shop. It eliminates machining to unnecessarily close tolerances when broader limits are just as acceptable. Also, calls for the manufacture of difficult or impossible parts are lessened when easy, economical alternates are known. This knowledge enables the engineer to design for high degrees of strength, accuracy and surface finish and still achieve metal economy. Attempts at closer coordination between engineering and shop usually result in an immediate reduction in scrap production. A careful study of the steps involved and the limitations encountered shows the way to lower cost production.

The first step in the production of diecast parts is the making of die drawings or layouts. This starts with the consideration of the diecasting machine to be used and ends with the design of the actual path of entry of the molten metal into the cavity. Between these two problems many others must be solved. Since all diecasting alloys take up less room in the solid state than when molten, the die designer must calculate the additional length of *every* dimension on the drawing so that when the casting reaches room temperature it will be the right size. The problem is further complicated by the facts that the casting is seldom free to shrink its normal percentage of length or volume, because of restrictions in the inflexible steel cavity, and that the die, made at room temperature, is used at elevated temperatures and expands. Further complications stem from the fact that one-half of the die is frequently kept hotter than the other in order to obtain good finish on the outside and yet not slow up the casting cycle by awaiting complete solidification.

The die must be of the finest steel obtainable in order for it to withstand abrasion, erosion,

thermal shock, high pressures and impact stresses. There are several ways of making the die cavity: (1) By handsetting of an accurate milling machine, lathe or other standard machine tool; (2) by duplicating the model on a Keller machine or three-dimensional duplicator; or (3) by means of a male hob or steel model pressed into a block of special hobbing steel. Whichever method is used, the die maker works from those dimensional instructions that appeared on the original drawing. These dimensions were only modified by the die designer in making the die drawing.

Completed dies are sent to the casting room while still in the soft, readily machinable condition. They must be handled very carefully lest they be damaged by nicking. The fit of its various parts and the freedom of motion of its sections must be checked before making the first shot.

Samples are cast using extreme care not to damage the soft die steel by allowing anything such as metal chips or flash to be caught between the two halves of the die. The more samples cast, the greater the danger of damage to the dies. Samples rarely have as good a surface finish as the parts will have when die temperatures reach the optimum.

Corrections are made in the die if needed, as well as such slight gate and overflow well modifications as are necessary. Additional samples are cast for the final check.

Hardening of the die is a very critical operation since improper heat treatment can cause the steel to expand or contract, to warp, and even to crack. The die is then ready for a production run. Further alterations to the die entail grinding rather than machining. Since they are much more expensive they should be avoided.

Tolerances Should Be Functional

The size and shape of the desired part should be completely identified so that there is no doubt in the mind of the die designer or the diemaker. The closer the tolerances, the more careful must the diemaker be and the longer will it take to build a die capable of consistent production of acceptable castings. From this conclusion it is seen that one of the most effective ways to keep tooling cost at a minimum is to hold dimensions to tolerances no closer than are dictated by functional needs.

A drawing with a general notation of "all dimensions to be held at ± 0.002 in." indicates an indifference to the work involved and a complete disregard for cost. Such accuracy is *never* necessary on *every* dimension.

There are two aspects of the problem of producing a casting to the dimensions called for on the print: (1) The planning and precision building of the die results in the production of samples that vary somewhat from the expected size. These variations can be adjusted before production starts. (2) The variation from casting to casting during production. These variations can be predicted and minimized but not eliminated.

With regard to the first type of variation, if any part of the die is found to be too small, there are only three ways to remedy the error: (1) By starting over; (2) by inserting a new section; or (3) by welding. To start over is, of course, very costly. To insert a new section *always* results in a seam appearing on the casting and *usually* means trouble with ejection, with trimming, or with both. To weld is difficult and, at best, uncertain. Even though the weld itself is sound and well bonded, the original heat treatment of the steel adjacent to the weld is adversely affected and may not stand up under the conditions of thermal shock inherent to the diecasting process. The designer should be sure that the diecaster knows which dimensions of the part can be no smaller, and which can be no larger.

Notes Tell Special Requirements

The liberal use of notes on drawings insures that special requirements receive the proper attention. When two parts fit together, each drawing should show the part number of the mating part and the dimension it must fit. It is also advisable to show information as to the class of fit, i.e., press, snug, sliding, or other. Where possible a sample of the mating part should be furnished. If machining operations are to be performed by the purchaser, the dimension before and after machining should be shown, or a note as to how much extra stock is needed for machining, added. Areas that must be free from ejector pin marks, cavity numbers, or trademarks should be identified. Exact location of part numbers should be shown. It is wise to allow as much leeway as possible on the use of fillets and rounded corners and to identify carefully all corners that must be sharp.

Except in the case of very short cores, some draft must always be allowed in order to permit the ejection of the part. Wherever possible the minimum allowable size of a hole should be given with a note indicating what draft is permissible and in which direction. There is often latitude in the placement of cores in either one of the die halves. The upper sketch in Fig. 1 shows the entire core in one half and the entire outer surface in the other. The lower sketch shows the effect of splitting the core between the die halves. A great deal of delay and trouble can be avoided by allowing from 1° to 2° taper on all side walls to assure unimpeded die opening and ejection.

The fact that so many variables enter into the determination of the shrinkage of the casting

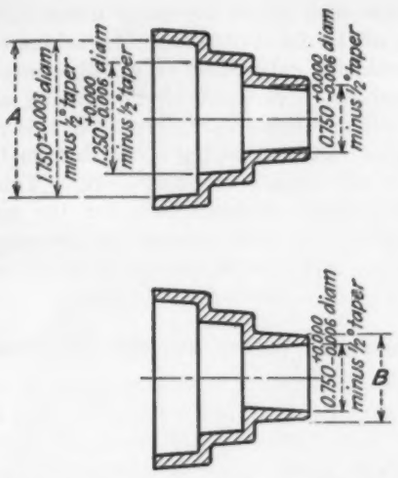


Fig. 1—If concentricity with the 1.750 and 1.250-in. diameters, A, is important, part should be dimensioned and drafted as shown on top. If concentricity with diameter B is important, part should be dimensioned and drafted as shown in bottom sketch.

indicates that a long dimension must have a greater tolerance than a short one. It is also advisable to dimension from a center or a convenient centrally located reference line or plane rather than across the entire view.

If a dimension is not only long, but ties together two points at different levels in the casting, as for example, a hole in the top of a long boss with a hole in a short boss, shrinkage is further complicated by slight but variable warpage of the casting on cooling. It is well to avoid such a dimension. If it is necessary to establish tolerances, the structure must be rigid at that point, see Fig. 2.

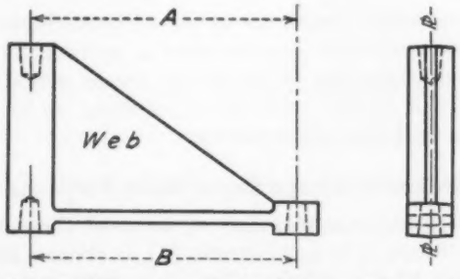


Fig. 2—When dimensioning holes or bosses at different levels, a web should be used for strengthening part. Wider tolerances are needed for dimension A than B to avoid warpage after ejection.

When first samples are produced they are checked dimensionally in the die shop before being submitted to the user. Die changes are not usually made until the user has also checked them. Human errors and the behavior of molten metal under the inter-action of many forces often cause samples to fail to measure exactly to the print. It is very easy at that point for the buyer's inspector to reject the castings and demand costly and time-consuming die changes. However, the deviation from blueprint may be of no importance functionally. It is, therefore, advisable for the designer to make sure he sees and passes upon the samples before they are rejected. All reputable diecasters will gladly make corrections that are definitely needed or even questionable. Unfortunately, everyone loses when the dies have to be re-worked.

The second type of variation involves dimensional changes as production proceeds. Diecasting is the most accurate method of converting a raw material to a finished product in a single operation. Many of the dimensions of a given casting do not vary at all, no matter how many thousands are produced. If the entire casting could be produced in one block of steel, this would apply to all its dimensions. But the dies must be made in at least two parts in order to remove the casting. For this reason, these must be clearance for the relative motion of these parts. Casting removal will also cause dimensional changes through wear in guide pins, guide pin bushings, and core guides.

The first and most important cause of variation between castings is the fact that the dies do not always close with the same tightness or intimacy, nor do movable cores always seat properly.

When the die is new, the sections of it fit together almost perfectly. They would continue to do so if nothing came between their matching surfaces. Under the extreme pressures used in forcing the molten metal into the cavity, some thin flashes of metal squirt out between the die halves and around movable cores. If they are thick enough to stay attached to the casting they are removed with it and do no harm. If they are only a few thousandths thick they may break away from the casting and fall into a part of the die where they can limit the next closing. The effect may be cumulative until the gap becomes large enough for metal to spit out of the

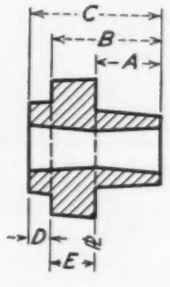
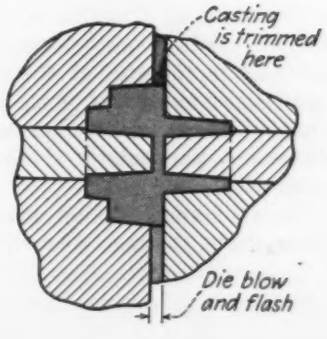


Fig. 3—Critical dimensions should be kept on the side of the largest profile, see top view. Accumulations of flash between the die halves result in production of defective parts, bottom view. Dimensions B, C, and E have increased; A and D have not.



die and make the interference apparent to the operator. With this variation in mind, the designers should keep as many critical dimensions on the side of the largest profile of the part, see Fig. 3.

Another source of variation in the dimensions of a diecasting is what is termed mismatch. The relative alignment or register of the two halves of the die is accomplished by means of hardened steel pins and bushings. There must be some clearance between them, to permit free sliding. This clearance allows some relative vertical motion between the die-halves and becomes more noticeable as the pins and bushings wear. The pins are kept clean and lubricated and are replaced when the wear becomes objectionable. This type of change is also present in the gradual wear that occurs in mechanisms that actuate movable cores and slides, see Fig. 4.

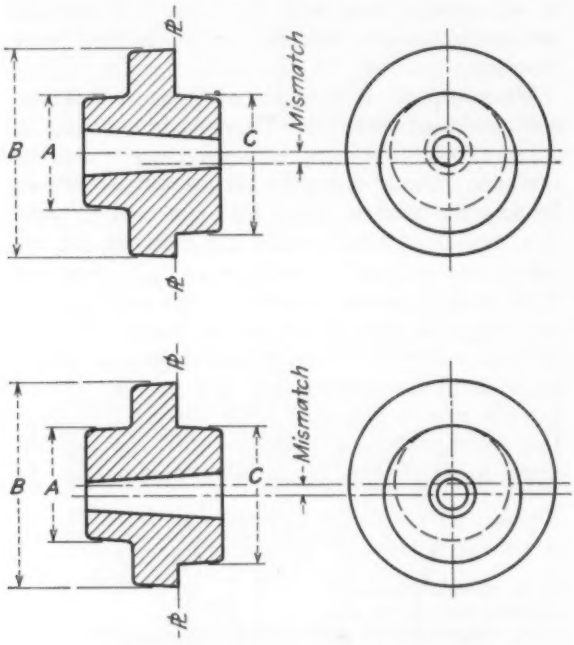


Fig. 4—Mismatch causes center hole core, set in die half concentric with A and B, to be eccentric with boss C, see top view. Below, center hole core, set in die half concentric with C, is eccentric with A and B.

The constant dragging of cores out of tightly shrunk casting holes causes wear and thus a decrease in the size of the hole formed. This wear is also minimized by the proper use of lubricants. However, occasional checking of hole diameters, particularly those of small size, is advisable.

Wear of another kind affects certain dimensions of the casting. Occasionally the direction and force with which incoming metal strikes a portion of the die cavity causes a washing or erosion commonly called soldering. This interferes with both the appearance of the casting and its ejection from the die. Since removing this roughness necessitates removing steel, that particular point in the casting becomes larger. This is a difficult change in dimensions for the user to catch before it gives trouble in the assembly operation. Because of this, it receives careful attention by all reputable diecasters.

Tolerance Tables Are Not Absolute

Published tolerance tables are academic rather than absolute. For this reason, it is not advisable either to insist on adherence to the minimum tolerance or to assume that a required accuracy cannot be held because the table so indicates.

Designing the part so as to allow parting the dies in a single plane is very important. A curved or stepped parting is costly to machine and to fit. By arranging that all points in the outline of the plan view are in a plane parallel to the plane of the drawing paper, or in a plane at a simple angle to the paper, minimum die cost is assured. Such a parting also allows the trimming of the part to be done in a simple form of punch-press tool and assures the best condition for satisfactory cleaning.

Major cores should be kept in that half of the die that does not form surfaces requiring a fine finish. Such surfaces are usually forced by the cover half of the die, which is operated at higher temperature than the ejector half. Cores in the ejector half assure that the casting will stick to them when the die is opened, allowing it to be pushed off the cores by the action of the ejector pins.

Engraving should not be placed on surfaces of double curvature. In the case of castings to be plated, engraving should not be put on a surface that will receive such heavy polishing as to remove or deface the lettering.

Standard Alloys Serve Most Purposes

In specifying the alloy to be used there are two things to be considered: (1) Is there a good reason why a special alloy is needed; and (2) how should it be identified? Most diecasters have a single standard alloy of each base-metal, that both fulfills the widest range of desirable characteristics when cast and introduces no unnecessary difficulties in the casting operation. To have many different alloys in a plant is to complicate scrap handling and introduce contamination hazards. If a special alloy is required, it should be specified by ASTM, SAE or Federal Specification numbers rather than by proprietary number or name, since such designations cause confusion and are contrary to the modern engineering aim toward standardization.

Powder Parts Invade the Appliance Field

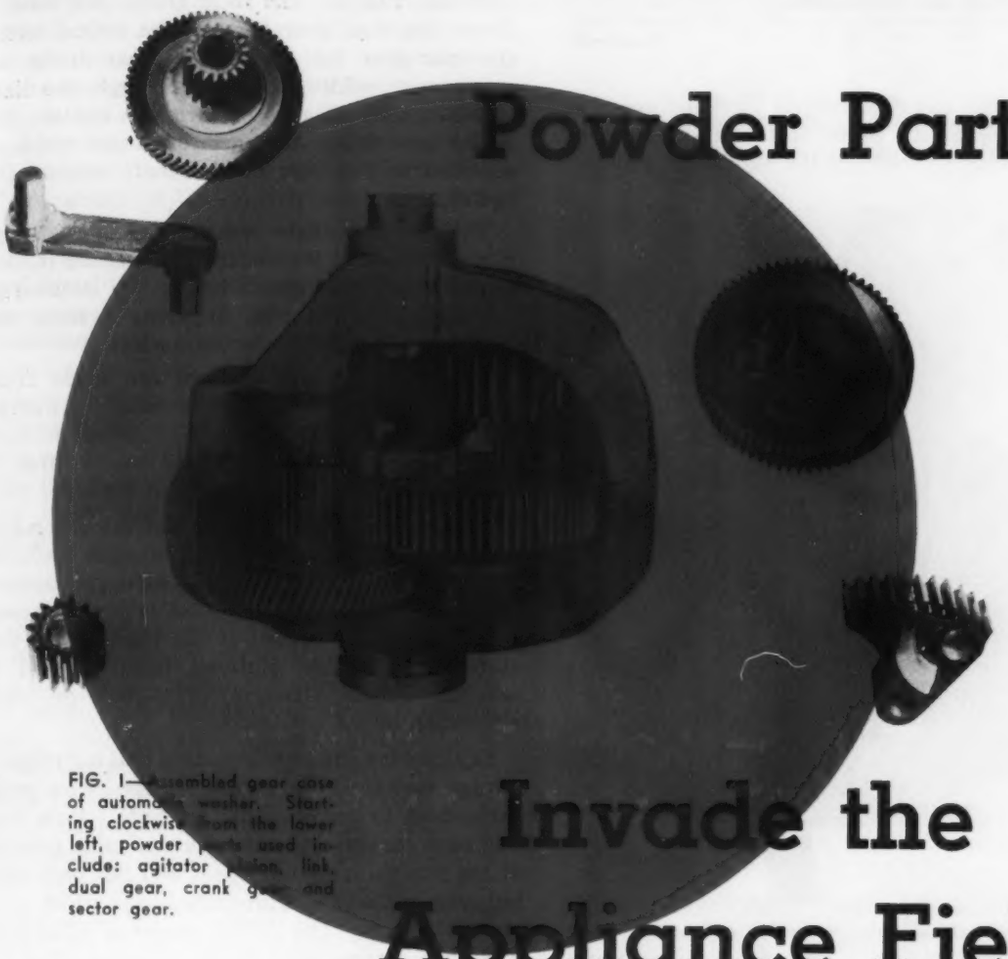


FIG. 1—Assembled gear case of automatic washer. Starting clockwise from the lower left, powder parts used include: agitator pinion, link, dual gear, crank gear and sector gear.

Powdered iron high strength, copper impregnated gears have replaced malleable iron castings in the gear train of an automatic washer. Savings of 60 to 70 pct have been realized.

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General Electric Co.,
Trenton, N. J.

IN the reconversion following the war the design engineer found a new material available for structural parts: high strength powdered iron. Unlike the porous bearings which had inherent lubricating properties unobtainable in the solid bearings they replaced, the sintered iron structural parts had to prove their value solely on an economic basis.

It was those parts requiring considerable specialized machining which enabled powdered metals to enter the structural parts field on a sound economic footing. These parts in turn had to meet certain design requirements brought on by the unique nature of the powder metallurgy process. The fact that metal powder under pressure does not flow like a liquid, coupled with the single pressure axis available with ordinary dies and presses, made this a unique process and limited the design possibilities.

A common part which fits remarkably well into

the powdered metal process is the spur gear, a toothed wheel with radial teeth parallel to the axis. A good example of the successful utilization of sintered iron gears is to be found in the General Electric clothes washers.

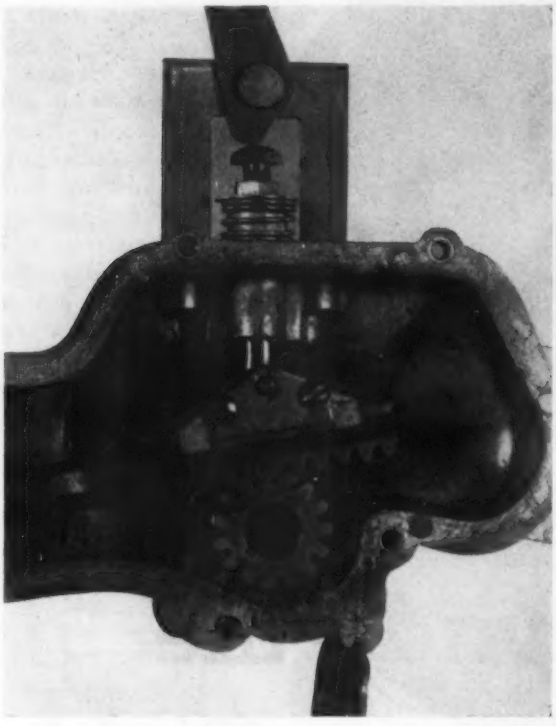


FIG. 2—Rack and pinion mechanism which drives the agitator.

The G. E. automatic washer employs a set of four gears mounted in a gear case to transmit the power of the motor to the agitator. This is shown in Fig. 1. The rotor shaft (not shown) drives the dual gear through the helical teeth; the spur gear half of the dual gear drives the crank gear, which, in turn, through the link, cranks the sector gear in harmonic motion; the sector gear drives the agitator pinion which is attached to the base of the shaft holding the agitator.

The G. E. wringer washer uses a rack and pinion method of transmitting oscillating motion to the agitator, as shown in Fig. 2. Because of the nature of the rack engaging system, the pinion is subjected to impact loading.

The gears described above are made from high strength copper impregnated powdered iron (Moraine S-62-1 mix). This powdered iron alloy replaces pearlitic malleable iron in three of the five gears and AISI C-1137 in the other two.

In the early stages of design of the automatic washer gear train, sintered iron as a material for gears was considered and a mix, corresponding to ASTM Specification B222-47T, was chosen for initial tests because at the time it was the standard structural sintered iron. It had a nominal tensile strength of 34,000 psi and elongation of 0.8 pct.

Engineering life tests indicated that a stronger, harder material was needed so the gears were carburized by conventional methods. Both gas and pack carburizing caused undesirable growth of the gears during treatment and salt bath carburizing left a salt impregnated gear which was unsatisfactory. The ASTM material B222-47T was then impregnated with a copper alloy to eliminate the porosity. This almost doubled the tensile strength of the material without changing the true matrix hardness to any great extent. Although this alloy was satisfactory for two of the four gears in the automatic washer gear train, it was still necessary to obtain higher

TABLE I

MECHANICAL PROPERTIES OF TEST BARS

Sample Number	Tensile Strength, psi	Elongation, pct per in.	Impact Strength, Inch lbs
A. Low-carbon, sintered S-60**			
1	19,400	*	20
2	19,200	4	30
3	20,200	4	23
4	19,500	4	21
5	18,900	3	28
6	19,700	*	27
7	19,200	3	25
8	19,500	3	25
9	20,000	*	23
10	20,000	4	37
B. Low-carbon, sintered and copper-impregnated S-60-1**			
1	52,100	5	90
2	51,900	*	104
3	44,800	*	98
4	48,800	*	116
5	48,500	4	91
6	45,800	2	100
7	49,200	3	91
8	48,500	3	128
9	49,100	*	98
10	49,100	3	104

Sample Number	Tensile Strength, psi	Elongation, pct per in.	Impact Strength, Inch lbs
C. High-carbon, sintered S-62**			
1	25,800	*	23.5
2	28,500	*	21.5
3	26,200	*	21.0
4	29,900	*	16.0
5	27,200	1	43.0
6	28,800	*	19.5
7	27,900	*	35.0
8	28,500	*	21.0
9	27,500	*	25.0
10	28,500	1	18.0
D. High-carbon, sintered and copper-impregnated S-62-1**			
1	75,500	1	96
2	75,000	*	76
3	76,400	1	87
4	67,300	1	87
5	74,100	0	82
6	75,400	*	106
7	73,600	0	82
8	71,300	0	89
9	76,100	0	90
10	74,300	0	85

Note: *—Broke outside elongation marks.
**—Alloy designation—Moraine Products Div., General Motors Corp.

hardness and strength on the dual and crank gears. A high carbon iron with no copper impregnation was tested next but this material also failed to meet the rigid overload life test.

The final material tried was the high carbon iron mix, copper impregnated. This material has a nominal tensile strength of 75,000 with low elongation. It is relatively hard in its sintered state and can be hardened by heat treatment. It was found necessary to harden the center bore of the crank gear and with this modification the high carbon iron mix copper impregnated gears stood up excellently on overload life tests. This alloy was specified for all four automatic washer gears. Subsequently this alloy was approved for the wringer washer rack pinion as well. In view of the impact loading which the rack pinion encounters, this application is perhaps the most severe of the five mentioned.

Gear Properties Described

Table I shows the effect of copper impregnation on the mechanical properties of a low (S-60) and a high (S-62) carbon iron mix. These values were taken from test bars obtained from the Moraine Products Div., General Motors Corp. and the alloy designation is theirs. The increases in tensile and impact properties have been attributed to the formation of a more cohesive material and the filling of pores to reduce their tendency to act as stress raisers. The physical properties of alloy "A" in Table I are similar both in tensile and impact to those of a class 20 gray iron using the same size test bars.

The use of test bars exclusively for control purposes has the disadvantage of giving no indication of variation in an individual part due to change in section thickness. For this reason, a tooth shear test has been set up as the main method of quality control of physical properties. This procedure is covered in another article by J. D. Carey and A. G. Pison of the General Electric Co., THE IRON AGE, Apr. 20, 1950, p. 95.

Metallurgically the microstructure of the sintered iron gears is comparable to a eutectoid carbon steel with the addition of a copper phase and nonmetallic inclusions. The microstructures of the alloys are listed in Table I. Figs. 3, 4, 5 and 6 correspond to the microstructures of alloys A. B. C and D in Table I respectively. All specimens were etched with 2 pct nital. Fig. 6, Alloy D, corresponds to the sintered iron in the washer gears.

A summary of the constituents commonly found in the high carbon copper impregnated mix along with important hardness values are listed in Table II.

The chemistry of the high carbon copper impregnated mix is nominally 1.00 total carbon, up to 30 pct absorbed copper, and the balance essentially iron. The center bore of the crank gear,

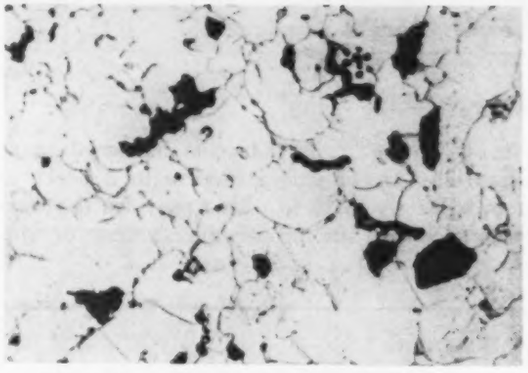


FIG. 3—Low carbon powdered iron. Structure consists of ferrite plus nonmetallic inclusions and voids. 500X.

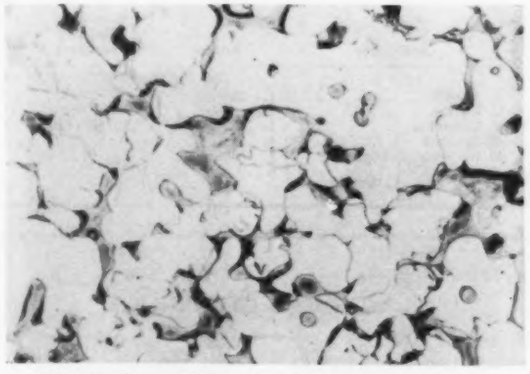


FIG. 4—Same alloy as in Fig. 3, but copper impregnated. 500X.

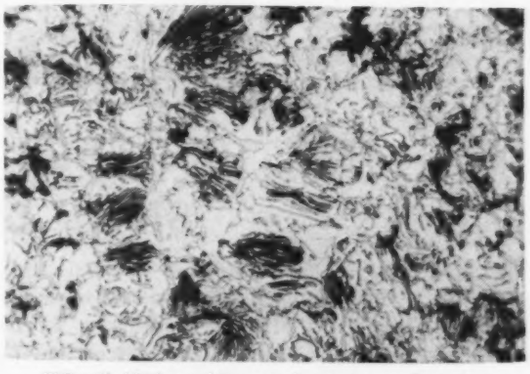


FIG. 5—High carbon powdered iron. Structure consists of pearlite, free iron carbides, ferrite and nonmetallic inclusions and voids. 500X.

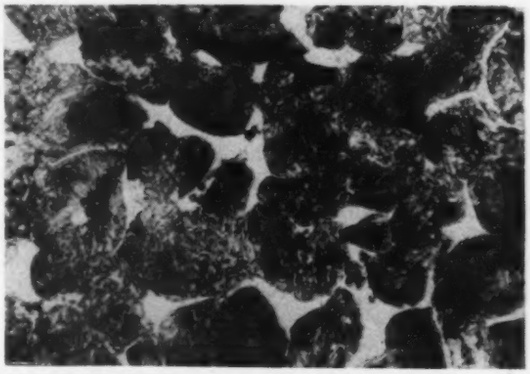


FIG. 6—Same alloy as in Fig. 5 but copper impregnated. Segregation of the free iron carbides and ferrite is not as pronounced. 500X.

No. 4, in Fig. 1, is induction hardened to an essentially martensitic structure to a depth of approximately 0.030 in. This provides the wear resistance for the proper functioning of this gear.

TABLE II

HARDNESS OF STRUCTURES

Constituents	Approximate Hardness Values	
	Knoop	Converted Rockwell Hardness
1. Pearlite	1. 250–300	20–30 RC
2. Ferrite	2. 200	90 RB
3. Cementite	3. 1000–1300	70 RC plus
4. Graphite	4.	
5. Nonmetallic inclusions	5. 500–600	50–60 RC
6. Copper alloy	6.	

TABLE III

MACHINING OPERATIONS

	Drilling	Boring	Honing	Hobbing	Facing	Hardening
Dual gear		x		x	x'	
Crank gear	x	x	x			x
Sector gear	x	x	x			
Agitator pinion	x	x				
Rack pinion		x				

TABLE IV

SAVINGS REALIZED

	Original Material	Savings by use of Sintered Iron, pct
Dual gear	Pearlitic malleable iron	69
Crank gear	Pearlitic malleable iron	67
Rack pinion	AISI C1137 steel	60
Agitator pinion	AISI C1137 steel	60

The manufacturing operations performed by General Electric on each of the five gears are shown in Table III.

The presence of both spur and helical teeth on the dual gear necessitates a hobbing operation to cut the helical teeth. Machinability of this alloy varies with the amount of the free carbides present in the structure. Liquid nitriding of the hobs substantially increases their useful tool life.

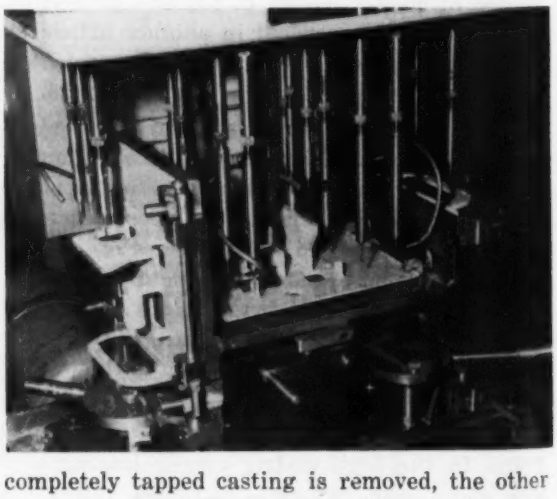
Sintered iron gears were selected for use in these washers on the basis of satisfactory performance and economy, as compared to other possible materials and methods. The initial die costs were approximately $25,000 with a large part of this cost representing broaches used to make the original dies. These broaches, however, are used for the reworking and replacement of dies at a much lower cost. Table IV shows the savings obtained, in percent, by the use of sintered iron bars. The sector gear was never produced in regular production from a blank, but was a sintered iron gear from the start.

FIXTURE TAPS THREE CASTINGS SIMULTANEOUSLY

A TOTAL of 22 holes in three different faces of a recording machine main frame diecastings are tapped utilizing this sequence fixture designed and applied at the Dictaphone Corp.'s Bridgeport plant. One machine using only vertical taps and with a single operator does a job which otherwise would require either an expensive 3-way machine or three multiple-spindle machines and three operators, with handling between machines.

The casting is first placed vertically in the first position at the left, where two holes in the top surface are tapped. The piece is then placed horizontally in the center position, where 16 holes are tapped. Finally, the casting is placed vertically in the right-hand position, where four holes are tapped in the end which was down in the first position.

At all times during a run there are three castings in the fixture. As the table is raised hydraulically, the castings are fed into the 22 taps, all of which are in vertical reversing holders. Then the table lowers automatically. The



completely tapped casting is removed, the other two are each advanced one position, and a new casting is put in the first position before the next tapping cycle starts. Castings are clamped and unclamped by means of quick-acting cam locks, the clamps for each position being operated by a single hand lever.

STRAIGHT-LINE ANNEALING AND CLEANING CUTS COSTS

New mass production annealing furnace and cleaning line, combined into one compact unit, reduces manpower, handling and floor space required for annealing and cleaning castings. The unit features complete automaticity, except for loading and unloading.

By **W. H. HOLCROFT,**
Executive Vice President and Technical Director,

and **E. C. BAYER,**
Metallurgical Engineer,
Holcroft & Co.,
Detroit

A NEW type of continuous mass production furnace, recently built and installed for an automobile manufacturer, provides a highly efficient method of annealing, descaling and desanding of castings.

While this type of furnace can be used in conjunction with a number of foundry and metalworking plant operations, this first installation was engineered to meet a specific need in the field of automatic transmissions. Any particle of sand or scale breaking away from the transmission housing would cause considerable damage to the intricate system of gears and vanes comprising the transmission, due to the extremely close clearances involved. This particular problem has been eliminated by the cycle through which the castings pass. By combining the annealing and cleaning operations into one compact unit, this equipment has also resulted in a saving of manpower, valuable floor space and handling mechanisms.

Fig. 1 shows the charge end view of the installation. Engineered, built and installed by Holcroft & Company, Detroit, this unit (patent applied for) functions automatically throughout the entire cycle, except for loading and unloading the stock. The installation consists of a two-row direct-fired pusher type annealing furnace, salt pot, water quench, acid tank, wash tank and soluble oil tank; it includes elevators and transfers, as well as a mechanized tray return conveyer, as shown in Fig. 2. The furnace has a capacity of 10,000 lb per hr based on net loadings of 40 lb per sq ft on 1 ft 9½ in. x 3 ft x 3 in. trays.

In the operation of this unit, the operator places the trays on the loading table. The outer charge and discharge doors open and a set of pusher dogs place two trays in the furnace advancing all trays in the furnace. The trays are conveyed through the furnace on rollers. At the discharge end, a set of transfer dogs removes a pair of trays from the furnace onto the cooling platform and at the same time placing two trays on the salt quench elevator. The charge and discharge doors close and the transfer dogs retract into a neutral position. The salt quench elevator then goes down into the salt bath and the other

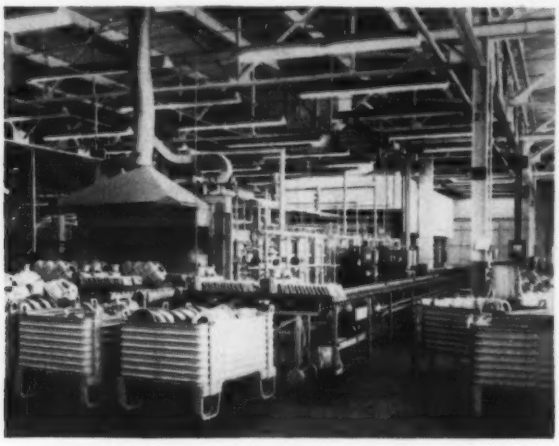


FIG. 1—Charging end of the continuous mass production annealing furnace. The unit is a two-row, direct-fired pusher type installation.

would be great. To overcome this obstacle, the elevators have rotating cages which revolve while in the immersed and upper positions. This scheme assures normal drainage and results in a more economical operation.

The annealing furnace has three zones of control operating at 1100°F, 1150°F and 1250°F respectively. The salt quench bath is operated at 800 to 950°F and is electrically heated by immersed electrodes. If desired, the salt bath could be heated by gas-fired radiant tubes. After the initial start, the salt quench temperature is helped by the hot stock entering the salt bath, so that very little electrical power is required to maintain the proper bath temperature. Provisions are also made to cool the salt bath, should it overheat. Removable sludge pans are provided in the salt bath.

The salt used in the unit illustrated is Virgo salt manufactured by the Hooker Electro-Chem-

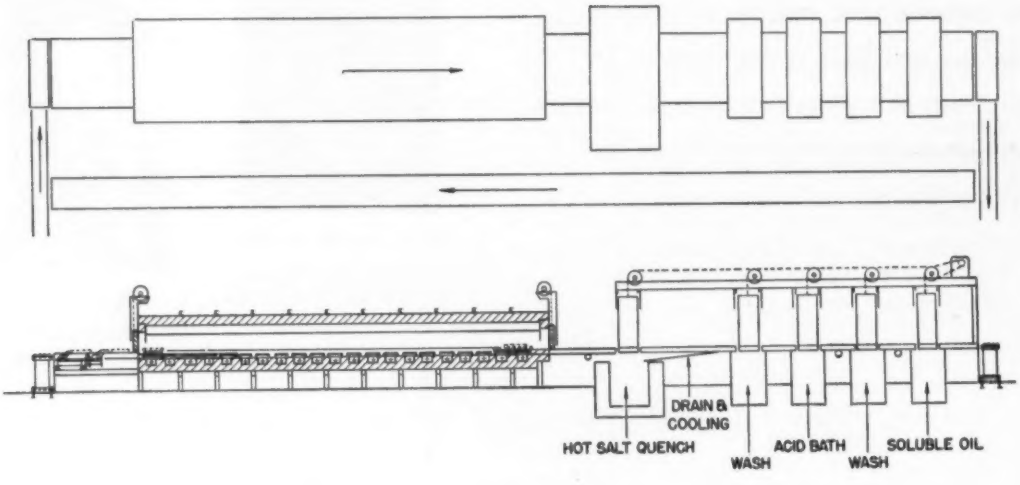


FIG. 2—Schematic diagram of the combined annealing and cleaning unit, showing the elevator and transfer mechanisms for moving the trays through the cleaning cycle.

elevators lower at the same time. The elevators remain in the immersed position for a predetermined time interval of 2 min.

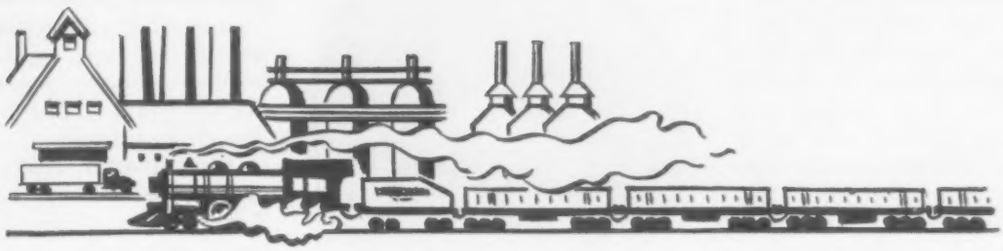
Meanwhile, the cross transfer reverses and, when the elevators rise to their normal position, the cross transfer moves forward advancing the trays one position through the sequence of water spray rinse, acid bath, water wash and soluble oil dip. After this last station the processed trays are removed and unloaded. The empty trays are then conveyed to the charge end of the furnace by power driven gravity rolls. The cycle is repeated every 4½ min, two tray loads being loaded and unloaded each cycle.

In some cases involving intricate castings, a few variations have to be made in handling the material because of the cavities and blind holes in the castings. Normally, the salt would not drain out of these voids and the dragout losses

ical Co., Niagara Falls, N. Y. The salt consists of a mixture of alkali metal hydrozides, oxidizing agents and certain catalysts. The hot salt renders the scale porous and also forms a silicate with the sand so that on subsequent water spray and acid baths, the violent reaction removes the scale and sand. The dilute sulfuric acid bath also serves to neutralize any remaining film of salt which may not have been removed in the water spray. The final wash and soluble oil dip render the stock acid-free and coated with a slight oil film to prevent rusting.

Other processes involving the use of various cleaning salts are also used for descaling purposes. Some of these processes require additional electrolytic equipment, while others require either bottled hydrogen or ammonia dissociating equipment. The unit can be changed to accommodate any of the processes.

News of Industry



Steel Plans 4 Million-Ton Capacity Boost

Confidential survey shows 2 million-ton expansion by end of this year . . . Another 2 million tons indicated as minimum for 1951 . . . New facilities, technological gains credited.

New York—American steel companies are adding more than 2,000,000 tons to their annual ingot capacity this year. The gains are coming from installation of new facilities and from improvements to existing plants. An additional increase of 1,790,000 tons is already planned for 1951. These increases—some 3.8 million tons in 2 years—were disclosed in a confidential survey just completed by THE IRON AGE.

Openhearths Lead

They mean that in the 6 years following the war the steel industry will have added more than 11 million tons to its steelmaking capacity. This additional capacity alone would permit production of more steel than was made last year in either France or Germany. The 11 million-ton increase is just about half of Russia's 1949 production.

Companies furnishing data for the survey have more than 90 pct of the ingot capacity of the country. More than a third of the increases which either have come or will come during 1950 are from new openhearth furnaces.

Of the remainder, much has already shown up in practice as gains from technological improvements. These include use of oxygen, better iron supply, changes in fuel practice or enlargement or redesign of existing openhearth or electric furnaces.

1951 Figure Is Conservative

A good share of the 1.8 million-ton increase already planned for 1951 is based on new openhearth furnaces. This means that technological improvements, which in many cases can not be estimated now, will swell the 1951 figure. It will probably top 2 million tons easily.

For a variety of good reasons, some companies are not publicizing their expansion plans now. Some of those that can be mentioned include:

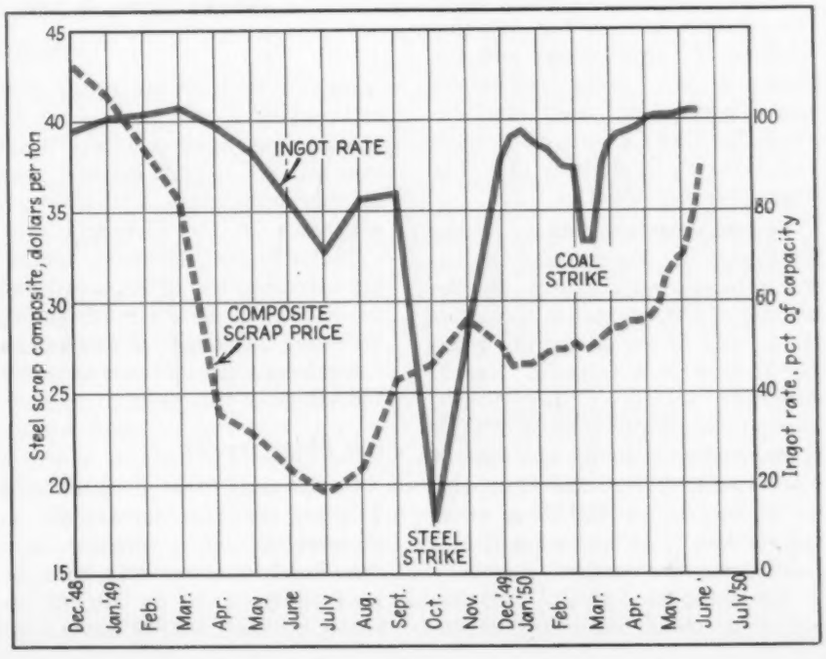
Armco Steel Corp., which is building a new openhearth shop,

Turn to Page 92

Join The Experts— Be Your Own Market Analyst

New York—Though steelmakers aren't happy about today's runaway scrap market, it is a pretty good indicator that their business will continue to be good. That is

Ingot Rate and Scrap Price—1949-50



if past experience is any criteria of the future.

In the past we have charted THE IRON AGE scrap composite price with the ingot rate (THE IRON AGE, May 26, 1949, p. 125). The lure of the graph usually suggests a guessing game—which is a lot of fun, even if it doesn't prove anything.

Play by Play—This is a time-tested method of predicting future business. It is used by the credited and the discredited alike—which only goes to prove that it should be mixed with other ingredients and stirred well before using. Even then it should be applied with caution.

The accompanying chart covers last year and this year to date. Here is a play-by-play description of what happened:

First Quarter, 1949—Steelmaking operations started the year very near 100 pct of rated capacity, quickly bubbled over the century mark and stayed there throughout the quarter. But THE IRON AGE steel scrap composite price started the year at $43.00 per gross ton. This high price was short-lived, as the bottom fell out of the scrap market.

There were plenty of other hints that the outlook for steel business was not a healthy one. High on the list were the shrinking number of new orders, the growing number of cancellations and the evidence that many consumers were "correcting" their steel inventories (later events made them bad guessers by showing that they over-corrected them).

Second Quarter, 1949 — At the beginning of this quarter the ingot rate started slipping. By the middle of the quarter it was skidding. And by the end of the quarter it was in a tailspin. Nearly everyone blamed inventories. Scrap prices hardly paused in their downward spiral. By the end of the second quarter the composite price was below $20.00 a gross ton, or less than half what it had been 6 months earlier.

Third Quarter, 1949 — At this point the threat of a steel strike caused the ingot rate to rebound sharply. At the same time a lot of consumers decided that their steel inventories were corrected, or over-corrected. Scrap prices started showing strength, too. And they climbed rather steadily throughout the quarter.

REST PERIOD?—One of the few men who does his job in a prone position, Paul Brennan rides a dolly through a 40 ft length of pipe, inspecting the welded seam at the new electric welded pipe mill of U. S. Steel's National Tube Co., McKeesport, Pa.

Fourth Quarter, 1949—The steel strike in October dropped the ingot rate almost to zero. Consumers who had recently been "correcting" their steel inventories started scrambling for steel which wasn't available. Even though the ingot rate dropped almost out of sight, scrap prices remained firm—suggesting an underlying demand for steel. Following the strike, the ingot rate skyrocketed higher than it had been before the strike started.

First Quarter, 1950 — Steel demand was healthy, but John L. Lewis started closing the dampers again and finally shut them completely in February. This dropped the rate to the low seventies. Meanwhile, scrap prices reacted uncertainly, possibly because of the coal situation. As soon as the coal strike was settled ingot rate and scrap prices both started a strong advance.

Second Quarter, 1950 — The ingot rate held steadily above 100 pct of rated capacity. Because of larger industry capacity resulting from postwar expansion programs, steelmaking records fell left and right. Scrap prices gathered steam from the bright outlook for steel (pressure from conversion deals played a vital role).

We think the runaway scrap market is just one of the factors which point to healthy steel business for many weeks. If you like guessing games, you tell us—HOW LONG WILL IT LAST?

Steel Plans 4 Million-Ton Capacity Boost

Continued from Page 91

estimates that by the latter part of this year it will have about 4.2 million tons, against 3,793,000 net tons on Jan. 1, 1950. Republic has already announced a 150,000-ton expansion in the Cleveland area.

Technological advances, including increased use of hot metal and use of oxygen, have already shown Wheeling Steel that it can get an annual capacity increase of about 295,000 tons this year.

Big Plans for '51

Continental Steel Corp. expects a 10 pct capacity increase due to changes in fuel application. Laclede Steel improvements have already stepped up its annual capacity by about 40,000 tons. Keystone Steel & Wire Co. expects production to be "considerably higher" this year because of wider use of oxygen and other technical improvements.

For 1951 there are some big programs projected. These do not of course include U. S. Steel's East Coast mill, which could not be in production for several years. Already publicized is a net gain of 442,500 tons which Jones & Laughlin will get from a new Pittsburgh openhearth shop.

Laclede Steel is engineering expansion of two 125-ton openhearths to 150-ton units for an expected increase of 35,000 tons in its capacity in 1951.

Resume Your Reading on Page 91

Republic to Install New Turbo Blower at Cleveland Plant

Cleveland—A turbo blower, which it is claimed will equal in size any in operation, will be installed at the Cleveland district plant of the Republic Steel Corp., the firm announces.

Eventual conversion of Republic's No. 1 blast furnace to pressure blowing and retirement of seven vertical steam blowing engines will result from installation of the new blower, designed to deliver 125,000 cfm with a pressure of 40 psi.

Republic's Warren, Ohio, plant operates a turbo blower of equal capacity. Five of the firm's 21 blast furnaces have already switched over to pressure blowing and it is estimated that application of the technique to the five furnaces results in an iron production increase equivalent to that of an additional furnace.

Steel Producers Asked To Tell All on Lobbying Practices

Washington—Eight major steel producers were ordered to tell what steps they had taken within the past 3 years "to influence policy or public opinion on national issues" by a Congressional committee investigating lobbying last week.

The steel companies involved are Armco, Bethlehem, Inland Steel, Jones & Laughlin, National Steel, Republic, U. S. Steel and Youngstown Sheet & Tube.

Answers of the firms will furnish the guide for writing new "restrictions" into the Federal lobbying law, said Committee Chairman Buchanan, D., Pa., who, incidentally, did not comment on the fact that no major steel producer employs a Washington lobbyist.

Buchanan's request went to 166 principal manufacturing firms, including a group of nonferrous metals processors, among them Alcoa and International Nickel. The steel companies must answer by June 15.

The Young in Heart

Ansonia, Conn.—Five veterans of a half century's service to the Farrel-Birmingham Co., Inc., receive diamond-studded service pins. Photographic evidence above shows that they stand hale and hearty and ready to devote more years.

Left to right are Henry T. King, Roderick R. Hazard, Christopher C. Harris, Joseph B. Wolfe, and Carl F. Schnuck, who is receiving his award from Franklin Farrel, Jr., former chairman of the board of directors and grandson of Almon Farrel, company founder. The quintet is in the vanguard of the Old Timers Club, the membership of which consists of men in service for more than 25 years.

Koppers to Build Carnegie Ovens

Pittsburgh—Two new coke batteries of 87 ovens each will be built by Koppers Co., Inc., at the Clairton Works of the Carnegie-Illinois Steel Corp. Work, to start this September, is slated for completion in the summer or fall of 1951.

The underjet type ovens, designed for coke-oven gas heating with recirculation of waste gases, will carbonize 5000 tons of coal and yield about 3300 tons of coke every 24 hours.

Designs New Furnace

Pittsburgh—A triple-fired slab heating furnace with a capacity of 100 tons per hr. is being designed by Rust Furnace Co. for installation at the Portsmouth, Ohio, plant of Detroit Steel Corp.

The furnace, which will burn either natural gas or oil, will serve a new strip mill at the plant. Dimensions will be 70 ft effective length and 22 ft wide inside.

Gets $1.5 Million Orders

Chicago—Orders totalling approximately $1.5 million for marine diesel engines, electric generating equipment and flood control pumps have been received by the Fairbanks, Morse & Co., according to Robert H. Morse, Jr., president of the company.

Orders include marine diesel engines for six passenger freight ferry boats ordered by the Brazilian government from an American shipbuilder. Among orders for electric generating equipment are three 3500 hp generating units for the Rural Electrification Administration project at Big Rapids, Mich.

Discuss Atom Harnessing

Detroit—The Detroit Section, Society of Automotive Engineers, recently heard Dr. Lawrence R. Hafstad, director of the Reactor Development Div., Atomic Energy Commission, discuss the practical aspects of using atomic energy.

INDUSTRIAL SHORTS

PROSPECTING COMPANY — The Australian Commonwealth Government in conjunction with the British Aluminum Co., Ltd. has formed the NEW GUINEA PROSPECTING CO., LTD. in Papua, New Guinea. Their purpose will be to locate and develop hydroelectric power and to seach for bauxite and other minerals relating to aluminum production.

EAST AND WEST—Two new plants will be in operation this fall by the STANDARD SEEL SPRING CO., Coraopolis, Pa. One plant will be located in Los Angeles and the other in Roebling, N. J. Both plants are expected to add over $1 million a month to the company's sales.

BUILDING WAREHOUSE—A new warehouse will be built by TRUSCON STEEL CO. on Willow St. in Youngstown, to store steel building materials. The cost of the entire project is estimated at more than $1 million. Walter Klemm will be warehouse superintendent.

HEADING PA GROUP — Roy Mills, purchasing agent, General Fireproofing Co., Youngstown, has been elected president of the YOUNGSTOWN DISTRICT PURCHASING AGENTS ASSN. W. N. Chill, G. D. Hopper and G. A. Renton have been named directors for 2 years. W. P. Zarbaugh will be a director for 1 year.

ADDITION — Warehouse facilities have been opened at 9630 Greeley Ave. in Detroit by the DUMAS STEEL CORP. Pittsburgh. The warehouse is equipped for shearing and pickling both strip and coil and will be represented by Lake Shore Steel, Inc.

DISTRIBUTOR — The Butterfield Div. of Union Twist Drill Co., Derby Line, Vt., manufacturer of taps, dies, reamers and special metal-cutting tools, has appointed the GARNER-SHELTON CO. of Detroit a distributor in that area.

CANADIAN AGENT—The De Laval Steam Turbine Co., Trenton, N. J. has appointed WILKINSON & McCLEAN, LTD. of Calgary, Alberta, Canada as sales representative for that province. They will handle turbines, compressors, centrifugal pumps, speed reducers, couplings and IMO screw-type rotary pumps.

PIPE MAKING—"Steel Arteries for the West," a new 16-mm colored industrial motion picture that tells the story of the manufacture of western-made pipe, has been released by the KAISER STEEL CORP., Oakland, Calif. It is available to the public on a free loan basis.

REDUCING HAZARDS — The INSTITUTE OF SCRAP IRON & STEEL INC., Washington, has started a safety program for its members designed to aid them in reducing worker injuries. The program consists of promotional material, informative bulletins for management, working plans and a technical safety advisory service is also offered.

NEW FIRM—The FRIGILATEM WELDING ALLOYS, INC. has been formed in Neptune, N. J., with A. E. Zeisel as president. The firm will develop and merchandise new and improved low temperature welding rods and fluxes, both gas and arc, for all metals and for all industries.

EXPANSION — An appropriation of $250,000 has been made by the BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass. for additional factory buildings and equipment in order to meet their increased business volume. The work will start immediately.

OPENS SALES OFFICES—A new district sales office has been opened in Detroit by the PENNSYLVANIA SALT MFG. CO. Harry G. Potts, district sales manager of the Heavy Chemicals Dept., will be in charge.

Gordon Edwards to Retire From U.S. Steel Executive Post

New York—After 50 years of service to the National Tube Co. and its subsequent parent company, U. S. Steel Corp., Gordon L. Edwards, vice-president and treasurer of U. S. Steel, will put down his portfolio this month for retirement.

G. L. Edwards

Mr. Edwards, 66 years old, is a Brooklyn boy who on graduating public school at 15 years of age was carrying papers as an office boy for the National Tube Co. in its 26 Cortlandt St., New York, office

Steel Looks Pretty Safe

Chicago—Reducing accident frequency by 15 pct and severity by 10 pct, the steel industry had the fourth lowest accident rate of all industries in 1949. Steel had 4.96 disabling injuries per 1,000,000 manhours as compared with an all industry average of 10.14 but it didn't do as well in severity with 1.49 days lost per 1000 manhours as against a 1.02 industrial average. These figures were brought out in a National Safety Council survey.

ASM Nominating Committee Picks Officeholders for 1950-51

Cleveland—The following men were chosen to hold office for the year 1950-51 by the nominating committee of the American Society for Metals: President, Walter E. Jominy, staff engineer, Chrysler Corp.; vice-president, Dr. John Chipman, head, Dept. of Metallurgy, Massachusetts Institute of Technology. Also: secretary, W. H. Eisenman; treasurer, Ralph L. Wilson, chief metallurgist, Timken Steel and Tube Co., Canton, Ohio; trustee, J. B. Austin, director of research laboratories, U. S. Steel Corp.,

Kearny, N. J.; trustee, Dr. James T. MacKenzie, chief metallurgist, American Cast Iron Pipe Co.

With Messrs. Austin and MacKenzie, the 1950-51 ASM Board of Trustees will consist of: Elmer Gammeter, chief metallurgist, Globe Steel Tubes Co., Milwaukee, Wis.; Thomas G. Digges, chief, Thermal Metallurgy, National Bureau of Standards, Washington; Arthur E. Focke, chief metallurgist, Diamond Chain Co., Inc.; Mr. Jominy; Dr. Chipman; Mr. Eisenman; and Mr. Wilson.

H. A. Roemer, Jr., Elected President of Sharon Steel Corp.

Sharon, Pa.—H. A. Roemer, Jr., was elected president, director, and member of the executive committee of the Sharon Steel Corp. at a recent meeting of the firm's board of directors.

H. A. Roemer, Jr.

He succeeds Henry Roemer, who has served as chairman of the board, a position he will retain, and president for the past 18 years. A. M. Tredwell, Jr., was voted the company's vice-president at the same meeting. Mr. Tredwell has been assistant to the president and director of personnel since February, 1949, starting with Sharon in October, 1930.

H. A. Roemer, Jr., served with the Superior Sheet Steel Co., Sharon Steel Hoop Co., Youngstown Sheet Mills, Republic Steel, and Pittsburgh Steel Co. In May, 1945, Mr. Roemer started with Detroit Seamless Steel Tubes Co., a Sharon subsidiary, and became its president in a year's time. Subsequently, he went to Sharon as a vice-president and later became vice-president and general manager of the corporation.

April Home Building

Washington—Preliminary estimates by the Bureau of Labor Statistics places new home starts in April at 126,000 units.

Industry's Pricing Muddle May be Cleared

Truman's signature awaited for bill affirming legality of freight absorption . . . Senate, House approve bill . . . FTC opposition long-standing . . . End of struggle possible.

Washington — Legislation declaring the legality of freight absorption was on President Truman's desk this week, following a 43-27 vote of approval last Friday in the Senate.

Although the Antitrust Div. of the Justice Dept. has stated it has no objection to the controversial bill, Mr. Truman had not yet indicated whether or not he will approve the 2-year-old proposal permitting a limited return to base-point pricing in heavy industry.

Overwhelming Approval

The fact that the bill won overwhelming approval in both Senate and House from a group of congressmen representing every geographic area of the nation may be taken as an indication that Mr. Truman will sign the measure. On the other hand, The Federal Trade Commission has steadfastly opposed the measure on the ground that it would "weaken the antitrust laws" and rob the FTC of its power to push anti-monopoly suits against industry.

Main Points of Bill

The bill approved by congress and now awaiting final action at the White House would:

(1) Amend the FTC Act by declaring the absorption of freight legal when practiced in the absence of collusion.

(2) Remove any restrictions in the Clayton and Robinson-Patman Acts against delivered prices by declaring that such prices are not unlawful if they "are not such that their effect upon competition may be that prohibited by this section." In this connection, freight absorption is declared legal "except where . . . its effect upon competition will be to substantially lessen competition."

(3) Amend the Clayton Act to provide that a seller who discriminates in price may show that such discrimination was made in good faith to meet competition.

Might End Pricing Muddle

If President Truman signs the bill it might become the agent for ending one of the longest and bitterest controversies ever existing between government and industry. For many years The Justice Dept. and FTC have carried on a running battle to force industry (steel) to stop using the basing point method of pricing its products.

After the Cement Case ruling by the Supreme Court, most steel companies decided that basing point selling was illegal and they switched their sales to an f.o.b. mill basis. Meanwhile, many types of industry raised a cry for some form of clarification by the government, so that they would know what methods of pricing were legal and what were illegal.

After a long struggle through various committees and House and Senate twice each, the bill has finally landed on the President's desk. It isn't what industry would have liked. But it is generally regarded as a long step toward clarification of the pricing muddle, and far better than nothing at all.

Plan Operations Shift

Chicago—Plans to shift operations of the Chicago Pneumatic Tool Co.'s Detroit plant to its Utica factory were announced recently by Edward Nagel, Detroit plant manager.

About 100 key employees will be transferred to Utica. The shift will boost the number of employees in Utica from 1300 to 2000. The change will be gradual and the Detroit plant is not expected to close until Dec. 30.

Wide Open Spaces

Birmingham—A good percentage of coal and iron ore miners in the subterranean shafts of the Tennessee Coal, Iron & Railroad Co., a U. S. Steel subsidiary, no longer must toil in a maze of bulky wooden timber supports that made their occupational habitat a weird cavern and was a discouragement to efficiency. By actually pinning the mine roof to solid rock with threaded steel bars and steel shin plasters as shown in the above photograph, the company has abolished the wooden pillars from more than 5 million sq ft of its mines.

As soon as a working space has been cleared, holes are drilled through the overhead coal or ore to hard rock. In the holes, slotted bolts of steel are wedged. The end of the bolt, projecting below roof level, is threaded and on it goes an ordinary steel nut and a large square steel plate. Thus far, not one accident from fall of roof can be attributed directly to the new method.

The company claims that with the pinned-up roof, slate picked from mine-run ore has fallen from an average of 275 tons per week to zero and acid content of conditioned ore has been reduced by about 2 pct. Also the new method costs less than the old. All this and safety, too.

Canadian Chrysler May Strike

Detroit—The strong production effort of Chrysler to attain record output and thus compensate for strike losses is threatened by an impending strike in the firm's Canadian subsidiary, Chrysler Corp. of Canada, Ltd. Company and union men have been meeting regularly but negotiations thus far have been deadlocked.

Harvester Earnings Fall

Chicago—International Harvester Co. earnings for the 6 month period ending April 30 were estimated at $23,403,000 in a report to stockholders. The $14 million drop from the corresponding period in 1949 was blamed on increased selling, collection and administrative expenses, and a drop in dividends from subsidiary companies.

Equitable Plans to Team Diesels to Freight Car Leasing

Parkinson discloses that contracts for diesels now under discussion.

New York—A wider breach in the field of financing railroad rolling stock will be made by the Equitable Life Assurance Soc. with its plan to push back the horizon on its freight car building and lease activity by entry into a similar venture with diesel locomotives.

Negotiations Pending

Declaring that the 2-month-old freight car leasing plan had garnered six rail constituents who had ordered 14,600 freight cars worth $77,492,000, Thomas I. Parkinson, president, said at a sales conference here last week that Equitable was discussing contracts for building and leasing diesels with manufacturers and roads.

He stated also that contracts for 5074 cars costing $28,261,000 were now under discussion with other roads and that the plan "was just getting started."

Leasing of the diesels will follow the pattern of the freight car system. Equitable will arrange with manufacturers for the building, pay 90 pct cash down payment and the balance in equal instalments over 5 years.

The diesels will be leased to railroads for 15-year terms, with rentals being paid quarterly. An option will permit the roads to either return the diesels at the end of the lease period or continue renting them for an additional term up to 10 years.

ECA Okays $20.5 Million In Spending and Guarantees

Washington—Marshall Plan expenditures and guarantees of about $20.5 million were announced last week. They are about $4.5 million for modernization of the Milan, Italy, FLACK steel works; an additional $8.5 million for machine tools for the Italian

FIAT automotive and steel works; $1.3 million to buy oil prospecting and drilling equipment for a French North African project.

Also: An additional $807,000 to modernize the Greek cement industry; $4.5 million for the purchase of 54 Pratt & Whitney engines, Curtiss propellers, and related equipment to be used in the construction of 15 commercial transport planes in France; and the guarantee of a $595,000 Ford Motor Co. investment with its French affiliate, Ford S. A. F., plus $325,108 in profits to be converted to dollars over a 12-yr period.

New Electronic Core Div. Established by Powder Ass'n

New York—The Metal Powder Assn. has established the Electronic Core Div. for iron powder electronic core manufacturers which recently held its first meeting in Chicago. William E. Cairnes, president, Radio Cores, Inc., Oaklawn, Ill., was elected chairman.

Present memberhip of the new division includes Stackpole Carbon Co., St. Mary's, Pa.; Magnetic Core Corp., Ossining, N. Y.; National Moldite Co., Hillside, N. J.; Powdered Metal Products Corp. of America, Franklin Park, Ill.; Pyroferric Co., New York; and Radio Cores, Inc., Oaklawn, Ill. The Speer Resistor Co., St. Mary's, Pa., has applied for membership.

Cleveland Graphite Alters Name, Duties of Monmouth Div.

Cleveland—Cleveland Graphite Bronze Co. has changed the name of its Monmouth Products Div. to the Replacement Sales Div. of Cleveland Graphite Bronze Co.

The Replacement Sales Div. thus becomes a part of Cleveland Graphite's General Sales Div. and will handle all markets in the replacement field, including N.A. P.A. Sales, Export Sales and Special Markets.

Raymond Z. Oswald, vice-president, Replacement Sales, heads the replacement organization. J. E. Bradley becomes sales manager, Distributor Sales, with R. H. Wickersham assistant sales manager. A. M. Currier, Jr. is sales manager, Special Markets and W. M. Williams becomes assistant to the vice-president, Replacement Sales. All were formerly associated with Monmouth Products Co., which was acquired last year by Cleveland Graphite Bronze Co.

Stainless, Alloy Producers Study Costs

Price increases would surprise no one . . . Boost in nickel price will raise costs $8 a ton on some types . . . Higher costs blamed . . . Nickel price now 48¢ per lb.

Pittsburgh—Producers of stainless and alloy steels are carefully studying the effects of the 8¢ per lb increase in the price of nickel by International Nickel Co. last week. Although they are reluctant to raise their prices, this could be the straw that broke the camel's back.

Absorb Higher Costs

They do not resent the action by International Nickel which announced that the burden of major cost increases could not be borne without a price rise. It therefore raised the price for electrolytic nickel from its Port Colborne, Ont., refinery 8¢ per lb to 48¢ per lb.

When steel prices took an upturn last December, stainless and alloy steels remained undisturbed. The same factors that forced other steel prices up—increased costs of labor and production—were absorbed by the producers. Thus the need to raise their prices now may be more pressing.

But alloy and stainless producers were stayed by competition within their field and with aluminum and certain carbon steels. The latter factor still stands but it may be forced to play second fiddle to economic necessity.

Biggest Backlogs

International's price boost will cause an increase in costs of about $8 a ton on chrome-nickel stainless. The estimate is conservative and is based on wartime production when scrap was used heavily to conserve new nickel.

With 8 pct of nickel required for some grades of steel, some observers doubt that producers can support the weight of the price increase added to past higher costs. They have the biggest backlogs in history. Stainless backlogs run deep into August, while alloy backlogs range to 60 days.

Another possible motivation for a price hike is the fear the new nickel price may have an inflationary effect on scrap prices. Stainless steel scrap has climbed 23 pct in the past 5 months.

If the nickel-bearing alloys are placed on a higher price stratum, the result might be mass confusion if consumers attempt a switch to chrome-moly. That would entail drastic production changes.

Stands for 2 Years

International Nickel said the new nickel price is about 40 pct over the average price prevailing for all markets in prewar years and compares with 65 pct to 125 pct for other base metals. The 40¢ price was predominant for many years prior to 1921 and stood for the past 2 years.

On July 22, 1948 the nickel price went to 40¢ per lb from 33¾¢. The latter price was in effect since early 1948 and was arrived at when International dropped nickel 1¼¢ per lb from 35¢ to compensate for a fall in the U. S. import duty.

Corresponding price hikes in nickel oxide sinter and other forms of nickel, including rolling mill products were also made by International.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

Stock Markets And Horse Races

IT is an axiom that the best minds in the country concentrate directly or indirectly upon Wall St. An overpowering self-interest directs intelligence to the stock market. Furthermore, this intelligence is concerned more with the future than with the past.

The opinions expressed in the form of quotations should carry a valid clue regarding the future of business. For here one finds concentrated not only all the information that is published dealing with the business but a great deal which must remain confidential. It is information sifted and weighed by experts and interpreted, in terms of value, by mature judgments.

What, then, does this market say regarding the future of business? On the basis of quotations it might seem that the buyers and sellers whose bidding establishes the level of the market are saying that the future is extremely bright. For the market today is at the highest level in almost 20 years.

It may be assumed, therefore, on the basis of the "averages" that the outlook from this point on is as bright as it was in the late 20's. This represents not the wishful thinking of a politician who hopes to remain in office but the tough-minded conclusions of men and women with substantial chips at stake who are registering their opinions, not in the form of interviews or speeches, but in the form of prices paid for the shares of America's leading corporations.

Unfortunately, as is so often the case, the facts of the stock market offer two diverse, conflicting opinions. While it is true that the market is higher today than it has been at any time since the boom of the 20's, it is also true that corporate earnings are being bought in the form of shares of stock for less than at any time in the last 20 years. If we take the representative list of 200 securities, including industrial, rail, utility, bank and insurance shares, whose averages constitute the Moody index, and determine the price per dollar of earnings which this index represents, we arrive at some startling figures.

For purposes of comparisons take the 5-year period 1935-1939 as a base or par. During this 5-year period the average buyer of stocks had to pay $18.50 to get a dollar of corporate earnings. He paid $24.25 for a dollar of dividends. Today this same investor, in buying the "averages," is paying only $9.10 per dollar of earnings and $16.50 per dollar of dividends. It is rather startling to note that this buyer is getting greater bargains in the stock market, when measured by the price of earnings and dividends, than he was able to get in 1942, a year after Pearl Harbor.

If it is true, therefore, that the price of a share of stock is the discounted present value of future earnings and dividends, then we have in these low prices an entirely different opinion of the future. This means that the average buyer distrusts the present level of earnings and dividends and does not expect them to continue into the future. In fact, on plain mathematics, it looks as though the present market is expecting at least a 50 pct drop in corporate earnings and a 33 1/3 pct drop in dividends. Unless the future sustains this interpretation, the stock market as a whole is distinctly on the bargain counter.

Needless to say, there are strong opinions backed by enormous wealth on both sides of this question. It is this clash of opinion which makes stock markets just as it makes horse races.

White Charges Government Hamstrings Industrial Expansion

New York — "Carefully and painstakingly" erected snares and obstacles by government planners hamstring industrial expansion and divert investment money from productive business to so-called "safe securities," declared C. M. White, president of the Republic Steel Corp., at the recent annual meeting of the Natonal Industrial Conference Board here.

"Clear the Path"

He called for a clearing of the path to industrial expansion by economy in government, adjustment in taxes, a change in governmental attitude to business, and the encouragement of venture capital by modification of confiscatory tax rates on upper bracket incomes from whence a large part of investment funds once came. The latter tax coupled with dual taxation on dividends have almost throttled industrial development, said Mr. White.

Reason for dwindling dividends, which dishearten investors, is the corporation use of a large part of earnings for expansion, Mr. White said. He also charged that the steel industry has been singled out as the "particular target" for government persecution and that intimidation of management is an overture to nationalization.

Keenan Addresses Foundrymen

North Adams, Mass.—John J. Keenan, vice-president of the International Moulders and Foundry Workers Union, was the principal speaker at the New England Conference of Moulders and Foundry Workers, representing 3000 employees, held here on May 21.

Market Consultant Engaged

Mount Vernon, Ohio—The Cooper-Bessemer Corp., as a step in its expanded program of market analysis, product development, and diversification, has recently engaged Robert P. Ramsey as a consultant.

Sees Need for U. S. Machine Tool Protection

McDonald, Commerce Committee witness, calls for tariffs, other measures to stop European inroads . . . Holds adequate machine tool facilities here are bulwark against disaster.

Washington—Warning that adequate machine tool facilities must be maintained in this country as insurance against national disaster, L. D. McDonald, vice-president, Warner & Swasey Co., Cleveland, called for imposition of import requirements or raising tariffs to prevent the nation's active machine tool capacity from falling below the level of safety.

Trojan Horse Spending

Testifying before the U. S. Department of Commerce Committee on Reciprocity Information, Mr. McDonald pointed out that the industry now faces serious competition inside the U. S., "competition which some of our own tax money helped finance."

Growth of the machine tool industry in England, Germany, France and Italy, has been such that these countries are now preparing to invade the American market, he pointed out.

"Imitations of American models are already being shipped into this country at prices far below those which we must charge for our own products," Mr. McDonald declared.

If the situation continues without any remedial measures, it is conceivable that within 10 years America would import many of its machine tools from abroad and our industry here would dwindle to half its size, he warned.

Remedial Steps

As a remedy for this situation, Mr. McDonald proposed that the U. S. might impose on machine tools the same import requirements that are imposed by European countries—they do not allow the importation of types they produce themselves.

Another step that might be taken is raising the tariff on machine tools imported from Europe, he said.

A third remedy would be a relaxation of present limitations with respect to the foreign importation of American machine tools.

"In many cases manufacturers prefer American models to those made in their respective countries. The latter possibility would have a secondary advantage which on the surface is not apparent but which is well recognized by the FBI."

"Sales engineers selling machine tools to any industry learn all about that industry. . . . The fact is that men in the sales departments of American machine tool companies at the beginning of World War II supplied considerable information to the FBI and other intelligence services concerning the productive capacities of various European factories, he revealed.

New Machine Cuts Tool Change Time by 80 pct, Claims Cross Co.

Detroit — A new Transfermatic machine 95 ft long that its builder, the Cross Co., claims will cut tool changing time by 80 pct and stop automatically when a tool needs changing was exhibited here recently to a limited group. It was then shipped to a producer of passenger car automatic transmissions.

The Cross Co. reports that the Transfermatic reduces substan-

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tially the number of relief operators needed for this type of equipment and has a built-in communications system of three telephones at the start, middle, and end of the machine.

The Machine Control unit is an ingenious device designed to reduce indirect costs of operation for a big transfer machine.

The machine combines 104 operations in a series of connected machine tool units. These operations including milling, drilling, reaming, counterboring and tapping. About 80 pct of the operations are drilling and tapping.

A special problem involved in designing the machine is that many of the holes are angular, creating special conditions that do not permit combining operations at a single station.

Tool Control Board

Basic components of the Cross Machine Control Unit are a master control board, master tool setting fixture, a work bench and Cross-designed Toolometers which shut down the machine automatically when a tool needs changing.

The control board is divided into sections corresponding to each type of tool in the machine. Every section has a tool setting gage, a tag carrying the tool and holder number, storage space for two complete sets of tools and holders and a Toolometer.

Keeps Tool Records

Large letters such as "A," "B," etc., on the board correspond with prominently displayed letters on the machine. Colors on the control board indicate the location of the particular machine head. Yellow indicates a right hand horizontal head; red is a left hand horizontal head, etc.

The Toolometer provides a continuous visual record of used and unused life in the tool. Thus, when the machine shuts down to replace a tool, the operator quickly checks on the board the remaining tool life in other tools.

Red areas on the Toolometer dials represent danger zones—equivalent to about two hours of

remaining tool life. When the machine stops, all tools with pointers in the two-hour zone are changed. The dials are reset after replacing a tool. The dial settings are adjustable for various tools.

Preserves Tool Life

All tools are assembled in adjustable holders. Many are preset to standard lengths. Two sets of tools are provided so that a tool damaged during installation can be quickly replaced. Since most tools are changed before the maximum life is reached, touchups rather than extensive regrinding are needed, it is claimed.

The latest Cross Transfer-matic conveys chips automatically to a central disposal point. Chips accumulate at the rate of 175 lb per hr. Rated production of cast iron transmission cases is 60 units at 70 pct operating efficiency.

Industrial Activity Declines

Boston—April New England industrial activity fell to an index figure of 140 from the March level of 142, using 1935-39 as the 100 base, reports the First National Bank of Boston. First 4 month aggregate output this year was listed as about 2 pct more than the corresponding period in 1949.

Coke Battery Completed

Chicago—A new $6 million coke battery, under construction for a year, has been recently completed by the Inland Steel Co. at its Indiana Harbor works. Known as battery No. 6, the installation will be ready for operation in about 60 days. It will presently replace No. 1 battery constructed in 1914.

ASTE Holds Panel Discussion

Detroit—The respective merits of high speed steels, cast cutting alloys and carbides were discussed by a panel of experts at the June 8 meeting of the Detroit Chapter, American Society of Tool Engineers. E. D. Wiard served as technical chairman of the meeting.

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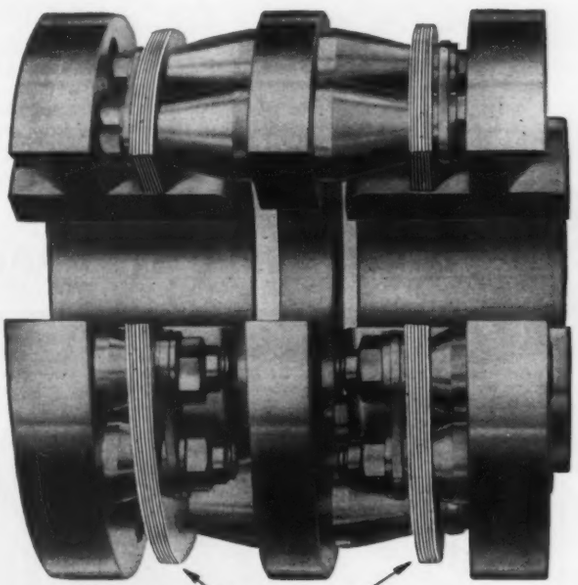

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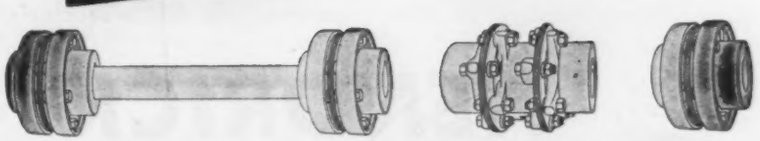

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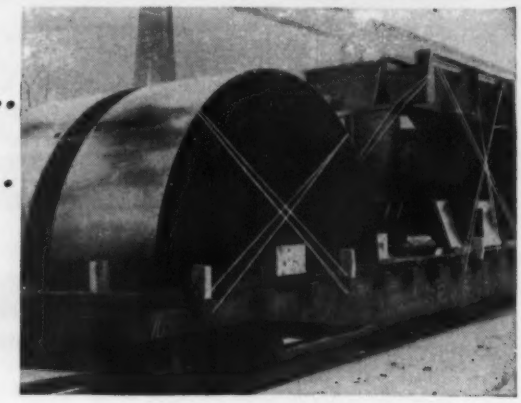

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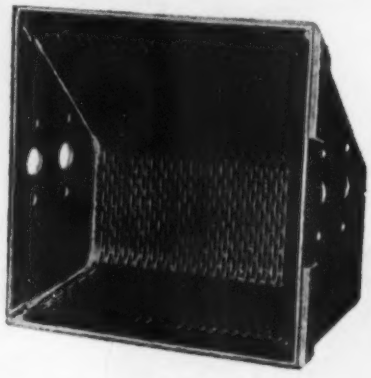
Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write in detail regarding any metal product you desire fabricated.

SEE OUR CATALOG IN SWEET'S

HENDRICK
Manufacturing Company
37 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

Profit Picture Too Rosy, Republic's Girdler Tells Meeting

Depreciation allowance saps listed profits . . . Asks new legislation.

Louisville, Ky.—Optimistic reports on current industrial prosperity are bloated past realistic proportions without consideration of obsolete and unjust governmental depreciation allowances that enfeeble listed profits, indicated T. M. Girdler, chairman of Republic Steel Corp., at the Midwestern Spring Conference of the Controllers Institute of America, here recently.

Mr. Girdler said that the rose-colored view did not consider that a company which had made a $1000 profit must spend $300 to replace a machine originally worth $100 and for which the government allows $100 depreciation. Profits are not what they would seem, he said.

Profits Drained Off

He urged that legislation with a more realistic basis be enacted and pointed out that the government stood safely in the sidelines, draining off at least 38 pct of profits—funds which could be used for industrial expansion to provide employment for a growing population.

He also answered governmental attacks on big business by stating that the interests of big and little business are interlocking, pointing out that Republic buys from 12,000 small businesses and that its products are purchased by 14,000.

To Build N. J. Warehouse

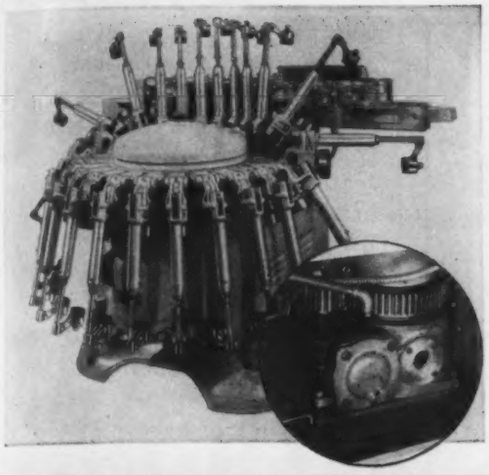
New York—On June 1 Lester Brion, president of Peter A. Frasse & Co., Inc., marked the start of construction of an 80,000-sq ft warehouse by breaking ground with a stainless steel spade. The warehouse will be used for the distribution of steel tubing, stainless and alloy steels, and cold finished bars to the metropolitan area and Connecticut.

Headquarters and area sales operations of the company will remain at 17 Grand St., New York.

For any kind of continuous load

—with or without 'shock'—

STANDARD CONE-DRIVE GEARS and REDUCERS
SAVE SPACE—SAVE TROUBLE—SAVE MONEY

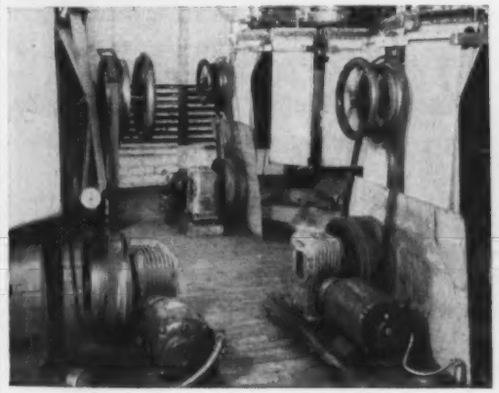


MIXING "POP" AT 190 QUARTS PER MINUTE

Liquid Carbonic Corporation's beverage mixing machines—over 200 of them—are driven through Cone-Drive standard gears. The 5″ center distance units are so compact —they're a cinch to design into the base of the machine. Rated capacity is 1.82 hp. at 792 rpm, so there is plenty of 'reserve', too.

PUMPING CEMENT AT 9000 psi

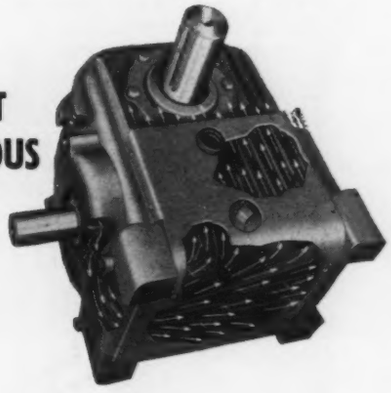
Cementing oil wells is a tough job calling for continuous PLUS shock loads. To make sure that its 15½″ center distance Cone-Drive Gears (rated at 68.3 hp at 150 rpm, Class II service) would do the trick on an even bigger pump, Halliburton subjected them to a continuous 141 hp at that speed. The housing stayed cool enough to put your hand on it. To handle that load, you'd need a 36 in. center distance non-Cone-Drive gearset. You couldn't even get it on a Halliburton truck.



MOTORIZING GIANT KNITTING MACHINES

When Winona Knitting Mills motorized its rotary knitting machines individually, they picked Cone-Drive reducers for this 24-hour-a-day, 6-days-a-week service. Each of the units handles 1½ hp at 1150 rpm.

and for LOWEST "CONTINUOUS LOAD" DRIVE COST



. . . there are always the Cone-Drive Gears fan-cooled and water-cooled reducers—available in *standard* and special sizes and ratios to fit practically any drive need. Check their cost against comparable reducers, fan or non-fan-cooled. You'll be amazed at what you can save.

CONE-DRIVE GEARS
Division, Michigan Tool Company

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

7171 E. McNichols Road • Detroit 12, U.S.A.

May we assist you, sir?

If you're on a merry-go-round about handling air or gas, *R-C dual-ability* can help you.

That's been our exclusive job for almost a century. We've developed the most extensive line of blowers, exhausters and gas pumps in the industry, with capacities from 5 cfm to 100,000 cfm.

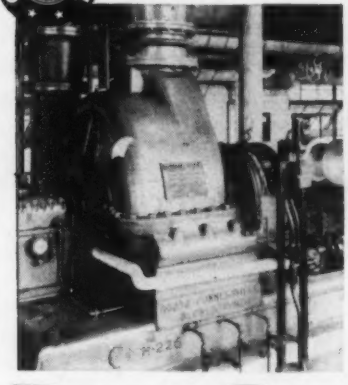
We're the only builders offering that *dual choice* of both Centrifugal and Rotary Positive equipment. Thus, without bias, we can suggest units that meet most closely the requirements of the work to be done.

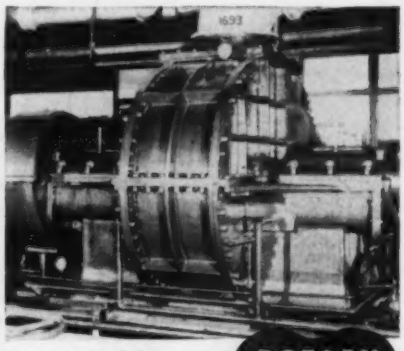
For new installations or replacements, look to us for your needs. Alert engineering teams up with modern construction to insure long-time, satisfactory performance of R-C equipment.

ROOTS-CONNERSVILLE BLOWER CORPORATION
506 Ohio Avenue, Connersville, Indiana

CENTRIFUGAL

Type H, 2-stage Centrifugal Exhauster for coke oven plant. Capacity 16,850 cfm.





ROTARY

Type RCGH Rotary Positive Gas Pump with capacity of 20,600 cfm in steel plant service. Driven by 450-hp synchronous motor.

ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

Marshall Plan Funds Seen Aiding French Industrial Pool

U. S. to be more than bystander . . . French seek British participation.

New York—The belief that the United States must assume more than a spectator's role in the French plan to mold the fragments of Europe's coal and steel resources into a titanic industrial unity was expanded last week by Washington sentiment.

Marshall Plan Aid

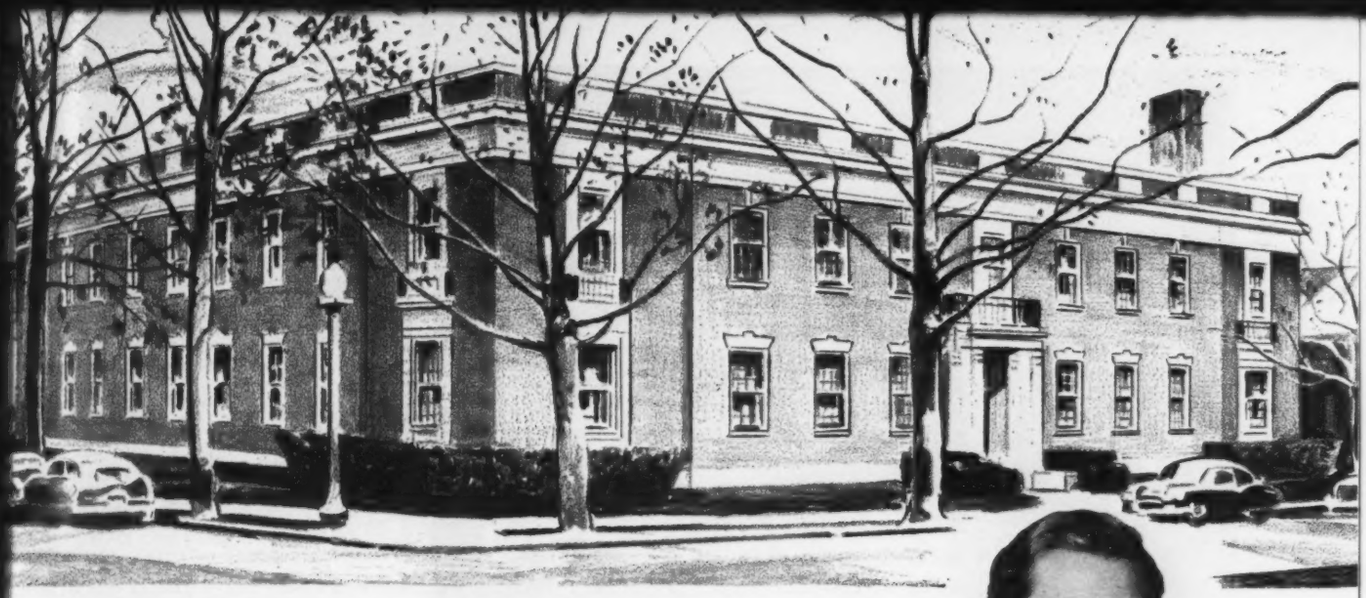
It is believed there that Marshall Plan funds specifically relegated to sponsoring economic integration can and will be logically employed in furthering the Schuman unification theme at its outset. American economists, while suspecting the substance of financial problems to arise, did not offer any concrete methods of financial assistance and will not do so until the problems *do* arise.

As a guardian of German industry because of membership in the Allied High Commission, the United States must decide on the desirability of permitting Germany to enter the Schuman plan. Its decision, judging from the present enthusiasm of Secretary of State Dean Acheson and other officials, will be affirmative.

English Entry Sought

French efforts to enlist the support of Britain have been determined. Some experts believe that France wants both sympathy and support from Britain so that the dozing German steel industry will not dominate the plan when it once again achieves production ascendancy.

European experts believe that while Britain may not respond with zeal to the pool, it must participate or cooperate. They say that the British steel industry, now regaining its balance, cannot compete favorably with the massive industrial bloc springing from the coalition.



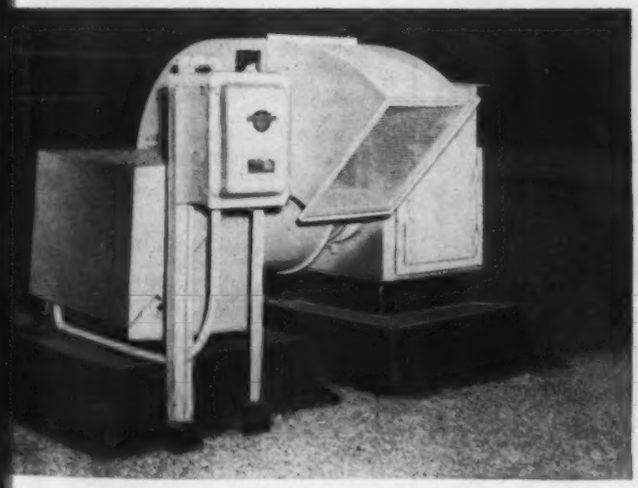
One of the many new exchanges with "Buffalo" air equipment and pumps.

AIR BY "Buffalo"

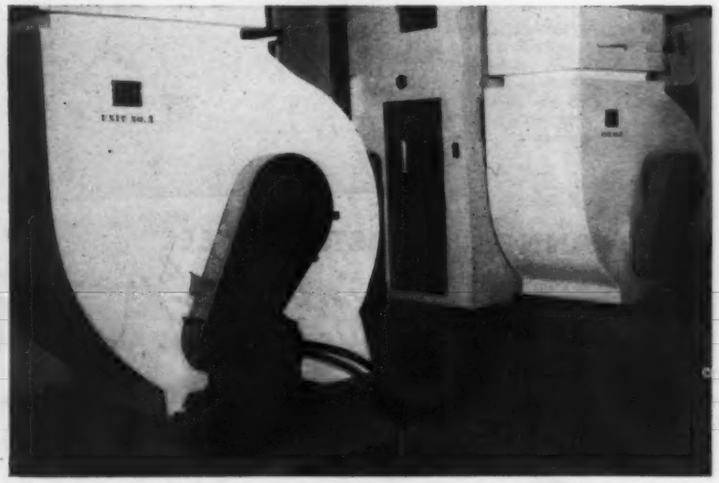
PLAYS A PART IN EXPANDED TELEPHONE SERVICE!

● Better service to more people is the result of a vast expansion program of the Telephone Companies. New buildings and new equipment bring service to many more subscribers—speed up long distance service —make available radio-telephone service.

Many of these new buildings, housing intricate equipment and highly trained personnel, have the finest indoor climate control. Units include "Buffalo" fans, dehumidifiers, comfort conditioning cabinets, "Buffalo" pumps and heaters. Don't take a chance on inferior air equipment in *your* building plans—specify "Buffalo", a leader in the field for seventy-two years.



"Buffalo" Belted Vent Sets Used to Exhaust from Dial Exchange.



"Buffalo" Type "LL" Fans—Air Supply Units insulated to handle refrigerated air.

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

492 BROADWAY BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont., Branch Offices in all Principal Cities

VENTILATING FORCED DRAFT | AIR WASHING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT EXHAUSTING PRESSURE BLOWING

• *EF Special Atmosphere Roller Hearth Furnace Continuously Bright Normalizing Two Strands of 27" Strip — Capacity 7200 Lbs. Per Hour.*

ANNEALING STRIP STEEL *Continuously* **IMPROVES THE DRAWING QUALITIES**

• EF continuous annealing and normalizing furnaces subject the entire length, and width of the strip to *exactly the same* time and temperature treatment, resulting in extreme uniformity of grain size, yield point, and completeness of recrystallization;— all definite advantages for deep drawing. They tie-up a minimum of material in process; — usually *cost less* than batch equipment of equivalent capacity.

Capacities to 28,000 lbs., or more, per hour — single or multiple strands to 54", or wider. Send today for complete details.

THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION *Salem - Ohio*

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

121 Tons, Gorham, N. H., surface tested gravel and twin span deck plate girder bridge. P. E. Susi Co., Pittsfield, Me., awarded contract. J. R. Richardson, Littleton, N. H., district engineer.

Fabricated steel inquiries this week included the following:

1000 Tons, Allegheny County, Pa., Pennsylvania Turnpike Authority, Section 31a, due June 20.

173 Tons, Allegheny County, Pa. Construction of a plate girder bridge. State Highway and Bridge Authority, Harrisburg, Pa. Bids to June 16.

130 Tons, North Adams, Mass., steel plate girder bridge on Depot St. George A. Curtis, Pittsfield, district engineer. Completion date Dec. 15, 1950.

111 Tons, Great Barrington, Mass., steel truss bridge. George A. Curtis, Pittsfield, Mass., district engineer. Completion date Dec. 15, 1950.

100 Tons, Buckland, Mass., bituminous macadam asphalt and steel stringer bridge with concrete slab and spiral reinforcement. C. B. Raymond, Greenfield, Mass., district engineer. Completion date Nov. 30, 1950.

100 Tons, Scranton, Pa., armory for U. S. Army Corps of Engineers, due June 20.

Reinforcing bar awards this week included the following:

3100 Tons, Philadelphia, apartment building, 18th and Walnut St., through McCloskey & Co., Philadelphia, to Bethlehem Steel Co., Bethlehem.

1600 Tons, Mercer-Middlesex Counties, N. J., New Jersey Turnpike Authority, Section 4, Contract 29, Brookfield Construction Co., low bidder on general contract.

1400 Tons, Allegheny County, Pa., Pennsylvania Turnpike Authority, Section 31b, Hunkin Conkey Construction Co., Blairsville, Pa., low bidder on general contract.

1200 Tons, Allentown, Pa., filtration plant, Progressive Builders, Inc., Pennsauken, N. J., through Concrete Steel Co., Philadelphia, to Bethlehem Steel Co., Bethlehem.

1100 Tons, Lawrence-Beaver Counties, Pa., Pennsylvania Turnpike Authority, Section 29b and 29c, B. W. Winkelman, Syracuse, N. Y., low bidder on general contract.

1035 Tons, Philadelphia, International Airport buildings, through John McShain, Philadelphia, to Bethlehem Steel Co., Bethlehem.

550 Tons, Plymouth, Mass., nine bridges and bituminous macadam through M. DeMatteo Construction Co., Quincy, Mass., to Truscon Steel Co., South Boston, Mass. Lewis R. Sellow, Middleboro, Mass., district engineer. Completion date June 1, 1951.

315 Tons, Trenton, N. J., New Jersey Dept. of Highways, Route 26, through C & T Construction Co., Collingswood, N. J., to Bethlehem Steel Co., Bethlehem.

195 Tons, Farnhurst, Del., Farnhurst Interchange, through Wilson Con-

tracting Co., Wilmington, Del., to Taylor Davis Co., Philadelphia.

190 Tons, Philadelphia, warehouse for Fred Whittaker Co., through Ballinger Co., Philadelphia, to Bethlehem Fabricators, Inc., Bethlehem.

175 Tons, Camden, N. J., Baldwins Run sewage plant, through Progressive Builders, Inc., Pennsauken, N. J., to Concrete Steel Co., Philadelphia.

150 Tons, Mechanicsburg, Pa., oil storage for U. S. Navy, Hughes-Foulkrod Co., Philadelphia, low bidder.

120 Tons, Westmoreland and Allegheny Counties, Pa., Pennsylvania Turnpike, to U. S. Steel Supply Co., Chicago.

Reinforcing bar inquiries this week included the following:

1140 Tons, Chicago, Argonne Cancer Research Hospital, George Sollitt Construction Co., Chicago, low bidder.

1087 Tons, Ephrata, Wash., West Canal laterals, Columbia Basin Project, Bureau of Reclamation, Ephrata, Spec. 3060, bids to June 22.

855 Tons, Westville, Ind., State Hospital for the Insane, Tonn and Blonk, Michigan City, Ind., low bidder.

657 Tons, Bakersfield, Calif., Friant-Kern Canal construction, Bureau of Reclamation, Friant, Calif., Spec. 3056, bids to June 20.

645 Tons, Allegheny County, Pa., Pennsylvania Turnpike, Section F.

513 Tons, Tracy, Calif., San Luis Wasteway, Delta-Mendota Canal, Bureau of Reclamation, Tracy, Spec. 3057, bids to June 21.

445 Tons, Mishawaka, Ind., sewage disposal plant, Tonn and Blonk, Michigan City, Ind., low bidder.

440 Tons, Summit County, Ohio Akron Expressway SR-5 Section 12.31.

365 Tons, Allegheny County, Pa., Pennsylvania Turnpike Section E.

340 Tons, Pennsylvania, State Dept. of Highways LR765/1-2/ and LR257/9/.

321 Tons, Los Angeles, box girder over Hollywood Freeway at Wilton Pl., California Div. of Highways, Los Angeles, bids to June 22.

280 Tons, Mineral County, W. Va., Keyser McCool Bridge.

227 Tons, Ephrata, Wash., Potholes East Canal and North Scooteney Dike, Bureau of Reclamation, Ephrata, Spec. 3068, bids to June 23.

200 Tons, Danville, Pa., State Hospital.

180 Tons, Chicago, elementary school at 2710 S. Dearborn St.

175 Tons, Elyria, Ohio, Memorial Hosp.

165 Tons, Jacksonville, Ill., Passevant Memorial Hospital.

130 Tons, Lake Forest, Ill., water works improvement.

124 Tons, Yolo Co., Calif., separation structures to carry proposed freeway over Route 99, intersection State Highways 6 and 99, California Div. of Highways, bids to June 21.

Sylvania Plans Tube Expansion

New York—Initial step to expand its radio tube manufacturing facilities during the next 6 to 9 months to meet the pressure of higher demand is announced by Sylvania Electric Products, Inc., as the immediate construction of a new plant in Shawnee, Okla. Scheduled for early 1951 completion, the new plant will have a capacity of more than a million tubes per month.

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.

HY-TEN Alloy Steels are steels with their own specific properties and definitely different chemistry from standard AISI and SAE steels. They are *not* AISI or SAE steels to which a trade name has been attached.

HY-TEN Steels offer the advantages of the latest metallurgical improvements before they are incorporated in the standard groups. The HY-TEN of today is the standard steel of tomorrow.

HY-TEN is a guarantee of uniform chemistry, grain size, hardenability, etc.

HY-TEN *and* STANDARD AISI and SAE Steels are stocked in a wide variety of sizes, shapes, treatments and finishes, thus assuring prompt reliable steel service from WL's seven warehouses.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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126 Sidney St., Cambridge 39, Mass.

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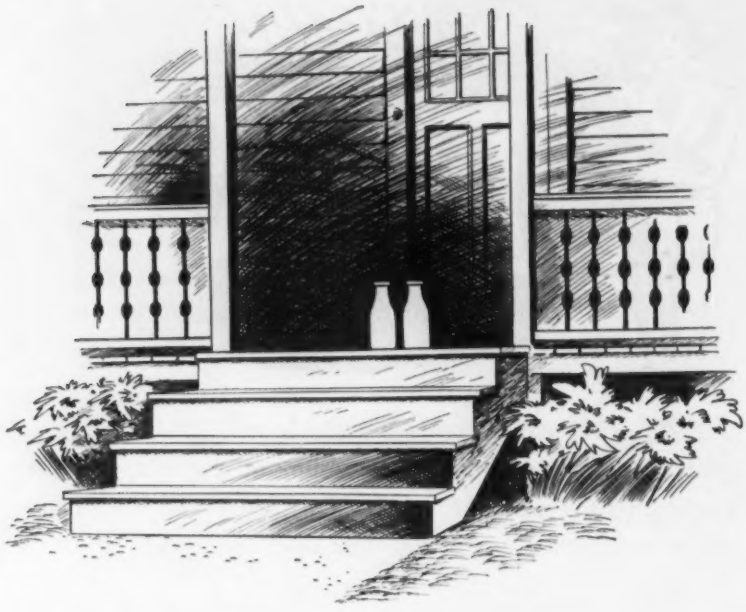


Not sales but customers

The way we see it, winning a customer is a lot more important than making a sale.

It's relatively easy to make a sale. But it takes a consistently good product, honestly sold, to win a customer.

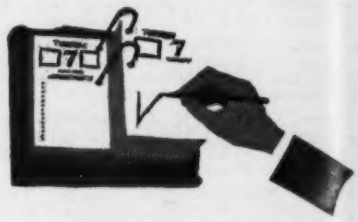
We like to feel that we aim for customers . . . not sales. Aiming that way, we make products that you want . . . products that will do the job you want done. And we keep trying to make them do that job better.

We think this point of view has helped us satisfy those who buy from us. We think that you might well consider that point of view when you are faced with any problem that involves the cleaning of metals.

Wyandotte Chemicals Corporation • Wyandotte, Michigan • Service Representatives in 88 Cities

Wyandotte
REG. U. S. PAT. OFF.

Dates to Remember



June 8-10—National Society of Professional Engineers, annual meeting, Hotel Statler, Boston. Society headquarters are at National Press Bldg., Washington.

June 11-14—National Purchasing Agents Assn., annual convention, Public Auditorium, Cleveland. Association headquarters are at 11 Park Place, New York.

June 12-16—American Electroplaters' Society in collaboration with the Electrodepositors' Technical Society of England, international electrodeposition conference, Statler Hotel, Boston. Society headquarters are at 473 York Road, Jenkintown, Pa.

June 12-16—American Society of Mechanical Engineers, oil and gas power conference and exhibit, Lord Baltimore Hotel, Baltimore. Society headquarters are at 29 W. 39th St., New York.

June 13—National Assn. of Corrosion Engineers, meeting, Poor Richard Club, Philadelphia. Association headquarters are in the Southern Standard Bldg., Houston.

June 19-23—American Society of Mechanical Engineers, semiannual meeting, Hotel Statler, St. Louis. Society headquarters are at 29 W. 39th St., New York.

June 22-23—Malleable Founders' Society, annual meeting, The Homestead, Hot Springs, Va. Society headquarters are in the Union Commerce Bldg., Cleveland.

June 26-30—American Society for Testing Materials, annual meeting and exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

June 29-July 1—National Industrial Advertisers Assn., annual conference, Biltmore Hotel, Los Angeles. Association headquarters are at 1776 Broadway, New York.

Sept. 5-9—National Chemical Exposition, Chicago Coliseum, Chicago. American Chemical Society, Chicago Section headquarters are at 86 E. Randolph St., Chicago.

Sept. 12-14—Society of Automotive Engineers, tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 13-15—National Petroleum Assn., annual meeting, Hotel Traymore, Atlantic City, N. J., Association headquarters are in the Munsey Bldg., Washington.

Sept. 18-22—Instrument Society of America, conference and exhibit, Memorial Auditorium, Buffalo. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 19-21—American Society of Mechanical Engineers, fall meeting, Hotel Sheraton, Worcester. Society headquarters are at 29 W. 39th St., New York.

Sept. 23-26—Packaging Machinery Manufacturers Institute, annual meeting, Homestead, Hot Springs, Va. Institute headquarters are at 342 Madison Ave., New York.

Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

SUNTAC ENDS LUBRICATION HEADACHE

Keeps Plant in Full Operation and Reduces Oil Consumption 50%

Cold-rolling threads on cold-headed bolts is a tough operation, and a mighty big financial headache, if the thread-roller does not receive proper lubrication.

Such a condition developed in the plant of a well-known manufacturer of screw machine products. Oil ran out of bearings and would not adhere to the guides for the reciprocating die holder. On several occasions the main bearings overheated and seized up. In each instance four days' downtime resulted, costing a large amount for labor and 30 percent in bolt production. Furthermore, the oil loss became so excessive that maintenance crews actually had to put in extra work to keep floors clean and safe.

In his search for a solution to the problem, this manufacturer called in a Sun representative, who induced him to try Suntac Oil. In the 18 months which have elapsed, there have been no production losses attributable to inadequate lubrication, downtime has been eliminated, and cleanups have been reduced to a routine minimum. The consumption of oil has been cut in half. Savings on oil and maintenance have amounted to more than $3,000.

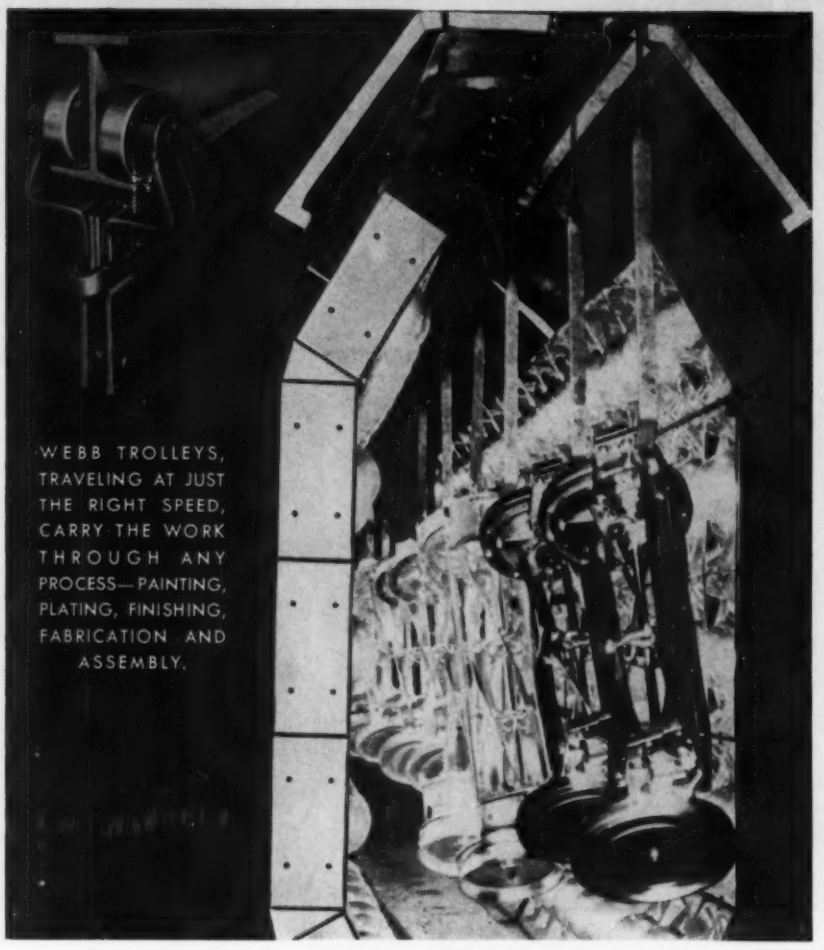
Suntac Oils are recommended for general lubrication in all machinery where retention of oil in bearings is a problem. These "Job Proved" products cling to the parts to be lubricated. For further information, call or write your nearest Sun Office.

SUN OIL COMPANY · *Philadelphia 3, Pa.*

In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO®



Again WEBB CONVEYORS Cut Costs!

Increased production, lower costs and better quality products were secured at this lawnmower plant when a Webb conveyor system was installed.

The mowers are now carried through the infra-red ovens at the rate of 88 *per hour*. The previous system handled only *50 per hour*. Baking time was reduced from 15 minutes (with forced air drying) to 5 *minutes* with infra-red. And the net results of baked enamel are infinitely better. This is a typical example of Webb ingenuity and efficiency. It is a practical combination of know-how and modern materials handling equipment which is working wonders for American industry.

JERVIS B. WEBB COMPANY

OFFICES IN PRINCIPAL CITIES
8917 ALPINE AVE.
DETROIT 4, MICH.

MANUFACTURERS OF OVERHEAD AND FLOOR TYPE CONVEYORS

FREE

PUBLICATIONS

Continued from Page 34

4-p. bulletin. Tool and equipment manufacturers requiring a high speed motor for grinding operations and other uses will find the page describing Onsrud industrial air turbine motors of considerable interest. *Onsrud Machine Works, Inc.*

For free copy check No. 9 on postcard, p. 35.

Air and Hydraulic Info

Aimed at providing a more complete understanding of air and hydraulics and the many possibilities of using these types of power, a new 8-p. booklet shows a number of circuit diagrams indicating how air and hydraulics may be efficiently applied to industrial equipment. The line of Gerotor air valves and cylinders, and hydraulic valves, cylinders and power units are also described. *Rivett Lathe & Grinder, Inc.*

For free copy check No. 10 on postcard, p. 35.

Packaging Twists

A number of examples demonstrating the versatility of Scotch Filament Tape No. 880 for reinforcing, banding and strapping in packaging and bundling operations are shown in a new 6-p. bulletin. This tape has a tensile strength of 175 psi, making it an excellent reinforcing medium for a number of jobs. *Minnesota Mining & Mfg. Co.*

For free copy check No. 11 on postcard, p. 35.

Auger Bits

Descriptive of the complete line of Midway auger bits, a series of new bulletins describes bits for hand braces and electric drills, available in 17 sizes. Also listed are 5, 6 and 13 piece sets for home and industrial use. Car bits in 10 sizes and 3 sizes of electrician's bits, new additions to the line, are described for the first time. *Midway Tool Co., Inc.*

For free copy check No. 12 on postcard, p. 35.

Resume Your Reading on Page 35

Now... Electronic Time Control

Use of the remarkable, versatile electron tube has proved to be an outstanding achievement in time control.

The new IBM Electric Time System with Electronic Self-regulation requires no special clock or signal wiring. All units in the system are coordinated perfectly—corrected automatically should they be fast or slow. Each clock in the system is merely connected to your building's regular AC wiring and is kept on the same, uniform time electronically. Each signal, connected in the same way, sounds automatically as scheduled.

IBM Time Recorders provide a convenient, accurate method of recording attendance and job time.

TIME . . . TO MODERNIZE

An IBM Electric Time System with Electronic Self-regulation will furnish a money-saving service for your office or plant, a welcome service to your employees. Send the coupon today for full information.

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☐ Please send brochure and technical information.

☐ I'd like to see a demonstration.

Name_____

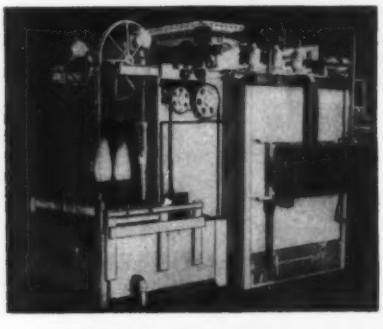
Company_____

Address_____

INTERNATIONAL BUSINESS MACHINES CORPORATION

DOW continues to SET NEW RECORDS OF PERFORMANCE AND SAVINGS

EXAMPLE OF DOW HEAT TREATING EFFICIENCY AT WARNER GEAR DIV.
Heat Treatment: .020"–.022" effective case, Carbonitrided 1600°F, Oil Quench, File Hard
Load: 2000 Rocker Shafts bulk loaded 12" deep, 1200-lbs net—1500-lbs gross
Heating Time: 55 minutes Total Furnace Time: 3 hours 15 minutes
Net Production: 370-lbs per hour



With only a fraction of the operator's time required at the furnace for loading work containers, charging the furnace and quenching the load, substantial savings in direct labor are realized. Consistent uniformity of hardness and case depth, freedom from salt film, scale and decarb, and reduced distortion improve quality and lower cleaning, straightening and inspection costs. This is only one of many case histories demonstrating savings which have amortized Dow Furnaces in a few months!

DOW FURNACE OFFERS

- Gas cyaniding for ⅓ to ¼ the cost of liquid cyaniding
- Uniformity of light case depths throughout load
- Unmatched versatility—gas cyaniding, gas carburizing, clean hardening or carbon restoration
- Improved quality. Forced, uniform quenching gives full hardness, reduced distortion.
- Maximum capacity with minimum investment and floor space

FIRST
WITH MECHANIZED BATCH-TYPE
CONTROLLED ATMOSPHERE FURNACES

THE DOW FURNACE COMPANY

Maccabees Bldg. • Detroit 2, Michigan
TEmple 1-3553

NEW

PRODUCTION IDEAS

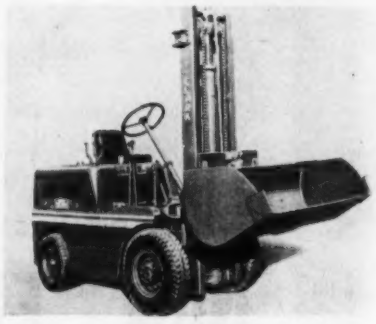
Continued from Page 38

with ratios from 1.5 to 9.3 and center distances from 2.7 to 15.5 in. Horsepower capacities range from fractional up to several hundred horsepower. Gearing is available in four basic pinion constructions and two gear types for maximum flexibility in application. Applications cover practically the entire field of parallel shaft power transmission within the size range offered. *Foote Bros. Gear & Machine Corp.*

For more data check No. 26 on postcard, p. 35.

Shovel Attachment

A scoop shovel attachment for fork-lift trucks, designed for full hydraulic operation through the cycle of picking up a load, tilting back for carrying, dumping and return to scooping position, speeds



handling and eliminates shocks. A hydraulic cylinder tilts the shovel from a carrying position 30° above horizontal to a dumping position 45° below with uprights vertical. The shovel is constructed of ¼-in. steel plate with a ½-in. steel center-reinforcing plate running from top to bottom. Widths range from 38 to 72 in.; capacities from 8 to 15 cu ft. *Clark Equipment Co.*

For more data check No. 27 on postcard, p. 35.

Continuous Mill Gage

Radioactive isotopes from the atomic pile are being used for the gaging of continuous strip material in a new instrument called the Beta Ray Continuous Gage. It is

Metal men have many reasons for using HOUGHTO-DRAW 357...

...this man likes the bright finish it provides

...this man likes the way it steps up production

...this man likes the cleaner tanks and lines (as compared to lime)

...this man likes its low cost per ton of steel drawn

...this man likes its ability to handle so many different jobs

Houghto-Draw 357 was developed as a superior drawing lubricant for bars and rods. It is in paste form, and contains waxes, fats and colloidal pigment, with an extreme-pressure additive.

It is recommended for cold drawing of hot or cold rolled bars or rods, particularly as a replacement for lime, being cleaner and providing a brighter finish. It's being used for cold-heading too, and for tube drawing.

Solutions come up to heat quicker because heating coils stay clean. No re-dip is necessary, as the coating is adhesive.

This drawing aid has been used in production for over a year without dumping the tank. For sheet drawing and stamping there are other Houghto-Draws that will step up production. May we demonstrate?

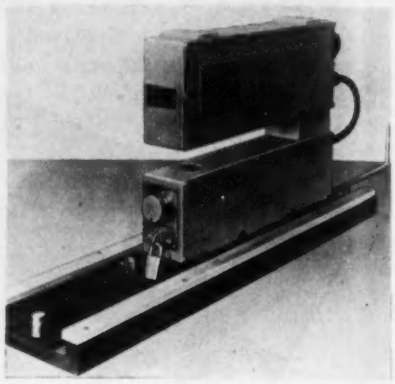
E. F. HOUGHTON & CO.
303 W. Lehigh Ave., Phila. 33
Fisher Bldg., Detroit

Houghton products for the metal-working industry include:

HEAT TREATING SALTS . . . QUENCHING OILS . . . CLEANERS . . . CUTTING OILS . . . RUST PREVENTIVES . . . INHIBITORS . . . "FORTIFIED" LUBRICANTS . . . PACKINGS AND LEATHER BELTING

Continued

non-contacting and will measure the thickness of materials that are wet, sticky, highly polished or soft. The gage operates in conjunction with a standard meter and will indicate any deviation in the thickness of strip or sheet material such as steel, tinplate, brass,

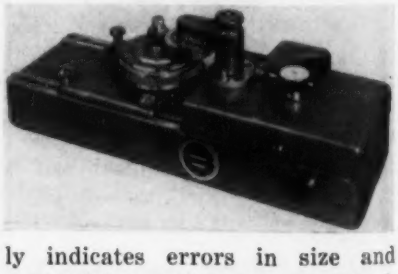


aluminum, rubber, and plastics. The instrument measures the weight per unit area of the moving strip by passing a small beam of beta rays through the strip. It may be calibrated in percentage of deviation weight per unit area, or decimal dimensions. Readings are said to be accurate to 1 pct. A standard recorder and process control or alarm signal circuits may be operated in conjunction with the gage. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

For more data check No. 28 on postcard, p. 35.

Gear Rolling Inspection

The new Red Ring gear rolling fixture facilitates loading and unloading a work gear and permits checking large, complicated assemblies. Gear rolling immediate-



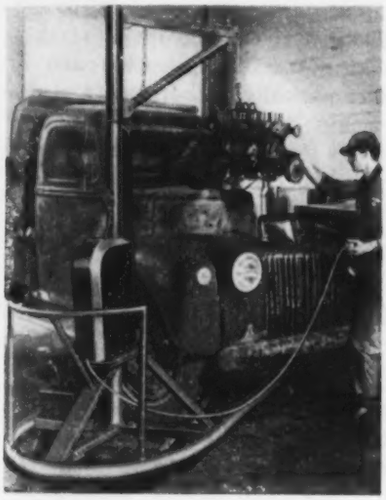
ly indicates errors in size and eccentricity, and serves as a check on excessive tooth roughness. The work part is held in a pot chuck, with a C washer and thumb nut to tighten it down, on a head adjustable for varying diameters. The

master gear, used for checking, is held by a swinging head that may be lifted up and swung clear of the work gear for easy loading and unloading. Inspection is made by advancing the carriage to bring the master and work gears into mesh. The gears are held in contact by constant predetermined spring pressure and rolled together. Errors are registered on the dial indicator. *National Broach & Machine Co.*

For more data check No. 29 on postcard, p. 35.

Electric Hoist

Tough lifting and loading jobs are simplified with a new electric hoist designed for one-man operation. The Lift-All will hoist, lower, stop and hold weights up to 2000 lb. It operates from its own shop

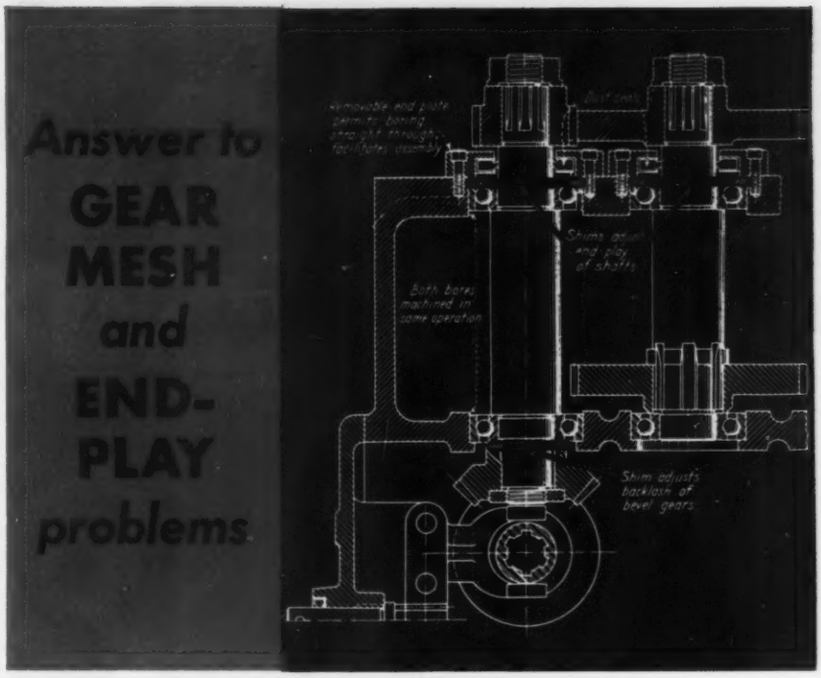


dolly or from any desired position on a truck bed, and can be shifted about by one person. Using push-button control, the operator is free to move about for load guidance. The boom, adjustable for height, swings completely around with its load. The Lift-All is powered by a specially-designed 6-v reversible motor; a 6-v car battery is used on the dolly; and the mechanical unit is completely housed in a metal cover at the base of the mast. *Lift-All Equipment Co.*

For more data check No. 30 on postcard, p. 35.

Automatic Bar Feed

An automatic bar feed for hand and automatic screw machines and turret lathes handles 12-ft stock bars of all shapes and sizes, and will feed any required length to the stop. It is limited only by the ID



IF YOU'RE WASTING TIME AND TYING UP A STANDBY LATHE . . .

Laminated shims can stop the expensive process of assembly, testing, disassembly, machining a few thousandths, reassembly, retesting and so on for many costly hours.

DO WHAT THIS LEADING MACHINE TOOL MANUFACTURER DID . . .

In the milling machine above, bores for inner and outer bearings are machined to one diameter in one operation. Removable end-plate permits boring straight through outer bearing housing and makes assembly of shaft, bearing and dust seal much simpler. SAVING: hours of machining and assembly time.

AND SIMPLIFY YOUR ADJUSTMENTS BY USING LAMINATED SHIMS . . .

Backlash of bevel gear and end-play of the two shafts are adjusted right at the job by peeling .002" laminations off the shims—with a pen-knife. Shaft and end-plate dimensions are calculated for shim thickness of .052". Shims are stamped at our plant from standard .062" (1/16") LAMINUM stock. RESULT: cumulative machining tolerances of —.010 to +.020" are possible.

Send today for our new data file with specifications, design factors and applications. Sample of ***LAMINUM*** included.

STAMPING • GRINDING METALWORKING SERVICES

Press capacity to 100 tons, 24 inches square, shallow draw. Special equipment and variety of dies can eliminate die-making for short runs. Wide stock of materials. Let us quote on your *difficult* jobs.

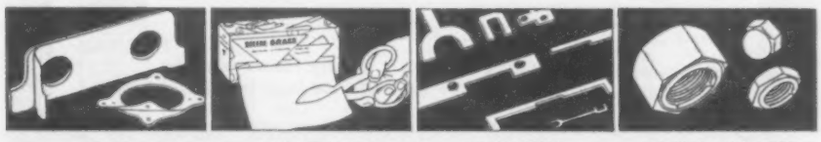
* **LAMINUM** (Reg. U. S. Pat. Off.) shims are solidly bonded units made up of .002 or .003 inch brass or steel laminations with a microscopic layer of metallic binder. Cut to your exact specifications.

LAMINUM

THE SOLID SHIM THAT peels FOR ADJUSTMENT

LAMINATED SHIM COMPANY, Inc.

3206 Union Street Glenbrook, Conn.



SHIMS SHIM STOCK STAMPINGS AN-COR-LOX NUTS

From Cellar to Roof
IT PAYS
To Cover Every Foot with
A.W. SUPER-DIAMOND
FLOOR PLATE

FOOT SAFETY IN EVERY FOOT

Why risk having costly slipping accidents anywhere in your plant, when it's so easy to eliminate them by installing A.W. Super-Diamond Rolled Steel Floor Plate? Today hundreds of plants are using Super-Diamond Floor Plate . . . in boiler rooms—on shipping platforms—on floors and trucking aisles—on walkways and fire escapes. In fact, it is used wherever men walk or climb in plants and on products. Remember, too, it's easy to clean, requires no maintenance, and can be cut and installed overnight with minimum scrap.

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FLOOR PLATES THAT GRIP

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Other Products: PERMACLAD Stainless Clad Steel • A. W. ALGRIP ABRASIVE Floor Plate Billets • Plates • Sheets • Strip • (Alloy and Special Grades).

Continued

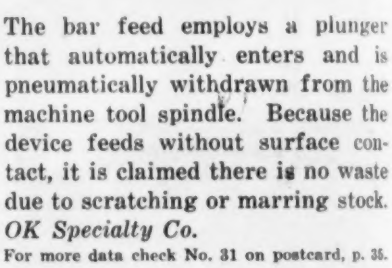
of the machine tool spindle, it is stated. Automatic feeding is accomplished when a pneumatic feed tube positions and aligns a stock bar into the machine tool spindle.

The bar feed employs a plunger that automatically enters and is pneumatically withdrawn from the machine tool spindle. Because the device feeds without surface contact, it is claimed there is no waste due to scratching or marring stock. *OK Specialty Co.*

For more data check No. 31 on postcard, p. 35.

Cored Split Tires

An improved method of replacing cracked or worn metal tires on kilns, coolers and driers is based on the use of a diagonally cored split tire. By means of interlocking machined mating surfaces in the rim, this tire can be positioned in the field without tearing out a section of a shell or disturbing the shell's existing alignment. After positioning, the split is welded to



make a full, solid ring. The only machine work required on the Stroh ring is the planing of the interlocking machined mating surfaces of the rim. Tires are machined from 0.35-0.45 carbon fully annealed AOH steel castings, ASTM specification A 27-46T Grade N. *Stroh Process Steel Co.*

For more data check No. 32 on postcard, p. 35.

Resume Your Reading on Page 39

Briefs and Bulletins

Johnstown expansion — Bethlehem Steel Co. will spend over $32 million expanding its Johnstown, Pa., plant. Its president, Arthur B. Homer, revealed the plans for the first time this week in a talk to the Johnstown Chamber of Commerce. Coke and pig iron capacity will be stepped up and there will be substantial rolling mill and materials handling improvements. Six of the Franklin openhearths have already been enlarged from 135 to 150 tons, the other 15 will be finished in less than a year and a half, Mr. Homer said.

warehousemen wary — Gradually increasing steel demand with more pressure indicated, has not yet caused West Coast warehousemen to alter their price structure. However, something in the wind to indicate that a few prices may not be too solid is the tendency to quote a few items on a short term basis. It is difficult to determine actual demand on scarce items such as sheets because buyers are placing orders with several jobbers and then accepting the first delivery available.

magnesium ingots—Dow Chemical Co. has advanced the price of magnesium ingots 1c per lb and magnesium alloy ingots, magnesium sticks and turnings by 1½c. There has been no indication of higher prices on magnesium semi-finished products but there is a sharp price spread between producers. The most recent price adjustment by Dow came 2 years ago when extrusion prices were moved downward.

cuts coming—Some warehouses and steel consumers report that because of second quarter carry overs big cuts in allocation of flat-rolled products will take place in July and August. Some will be as high as 50 pct. Mills are running 30 to 60 days behind in deliveries of sheets to warehouses. They are now becoming very cautious about overselling the third quarter.

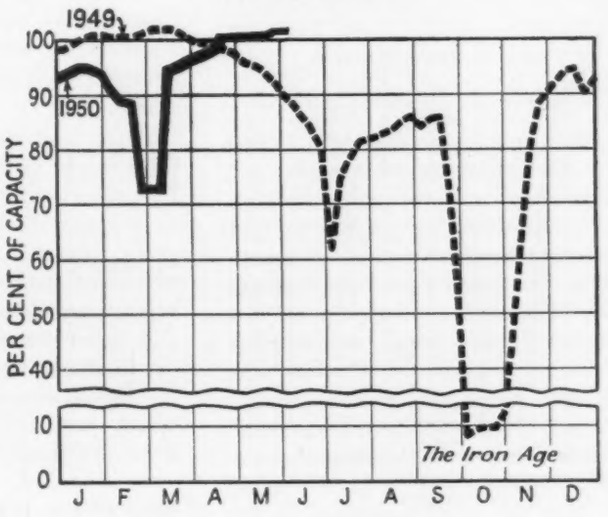
conversion prices– With every jump in the price of scrap, conversion market prices go up in proportion. Cold-rolled sheets that were selling for $175 per ton a week ago are now going for about $180. The highest price paid for conversion sheets was a reported $195, delivered Chicago. Slabs were selling for $97.50, delivered Chicago, while ingots were bringing $75 in Pittsburgh.

decision delayed — The Supreme Court postponed action on a hot antitrust issue this week. A case involving the Standard Oil Co. of Indiana and raising the issue of whether or not a producer may quote different prices to different buyers if such prices are made in good faith to meet competition was set for reargument before the high court next autumn. But the issue may become an academic one if legislation—S. 1008—answering this question affirmatively is signed into law by President Truman.

keeping pace — Although one major West Coast producer is operating well below national and Coast averages, other western producers are turning out steel at such a clip that western production as a whole is keeping pace with the national picture. Overall result on the Coast is a heavy drain on scrap.

Alcoa price hike — Aluminum extruded shape prices were moved upward last week by the Aluminum Co. of America. Alloys 3S, 14S, and 16S were raised ½c per lb. Alloys 24S and 75S went up 1c a lb and no change was listed in 65S.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
May 28	103.0*	104.2*	92.0*	88.0	96.5*	104.0	109.5	104.0	105.0*	102.0*	92.0	91.0	112.0	101.5
June 4	102.5	103.7	94.0	88.0	98.0	104.0	108.0	102.0	101.0	102.0	92.0	91.0	100.0	101.5

* Revised.

Nonferrous Metals OUTLOOK

Market Activities

by JOHN ANTHONY

Metal prices begin rapid rise . . . Copper up 2¢ . . . Zinc up 2¢ . . . Magnesium up 1¢ to 1½¢ . . . Nickel up 8¢ . . . Brass and aluminum ingots advance.

New York — The metal price spiral began to rise more rapidly last week, when heavy advances were made in primary metals, ingots and scrap. The price of copper was upped by 2¢ per lb on June 5 on action taken by several sellers. While other sellers did not join in the rise at once, copper could not be had at the former price. The delivered price is now 22½¢, only 1¢ per lb below the postwar peak price.

Scrap Forces Copper Up

The copper advance was forced by the shortage of copper and brass scrap at recent quotations, coupled with the continuing strong demand for primary metal. The shortage caused one refinery to offer 18¾¢ last Friday for heavy copper scrap, an advance of 1¼¢ per lb. On Monday, the buying price was raised another ¼¢, and the offer became general. Thus the rise in the primary copper market was brought about.

Zinc advanced a total of 2¢ per lb last week, ½¢ on Monday and 1½¢ on Friday. The metal is now priced at 14½¢ East St. Louis, only 3¢ below the postwar peak. All producers had not joined in the latest rise early this week, but metal was not being offered at the lower price. The rise in zinc is due to the heavy demand for all grades and a growing worldwide shortage of ore production. If the present rate of demand is continued there is every prospect for even higher zinc prices.

Brass and bronze ingot prices were raised twice in the last week. Last Wednesday the rise was ½¢ to ¾¢ per lb, due to recent zinc price advances. On Monday, prices of manganese bronze and yellow ingot were advanced 1¼¢, and other ingots were raised 2¢ per lb, due to the copper price rise.

Aluminum secondary ingot prices are creeping steadily upward. At present quotations they are very slightly below the new higher prices for virgin ingot. The shortage of aluminum scrap is primarily responsible for rising aluminum ingot prices.

Magnesium Ingots Up

Dow Chemical Co. advanced the price of commercially pure magnesium ingots 1¢ per lb last week. Prices of magnesium alloy ingots, and pure magnesium sticks and turnings were advanced 1½¢ per lb. This is the first price adjustment in magnesium in the past two years. There is no information yet available on rises in semifabricated forms of the metal, although there are wide price spreads between producers.

International Nickel Co. put into eqect last week an increase in the price of nickel and nickel products amounting to 8¢ per lb. This brings the price of electrolytic nickel to 48¢ per lb f.o.b., Port Colborne, Ont., duty paid. The increase is attributed to higher costs.

NONFERROUS METALS PRICES

	May 31	June 1	June 2	June 3	June 5	June 6
Copper, electro, Conn.	20.50	20.50	20.50	20.50	22.50	22.50
Copper, Lake, Conn.	20.625	20.625	20.625	20.625	22.625	22.625
Tin, Straits, New York	78.125	77.875	78.125		78.00	*78.125
Zinc, East St. Louis	13.00	13.00	14.50	14.50	14.50	14.50
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.
* Tentative.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in May based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	19.923
Lake Copper, Conn. Valley	20.01
Straits tin, New York	77.50
Zinc, East St. Louis	11.99
Zinc, New York	12.71
Lead, St. Louis	11.52
Lead, New York	11.72

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 27.4¢; 4S, 61S-O, 29.3¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.8¢; 0.081 in., 2S, 3S, 28.4¢; 4S, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.032 in., 2S, 3S, 30.0¢; 4S, 61S-O, 34.0¢; 52S 36.7¢ 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 48.1¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 24.8¢ 4S-F, 27¢; 52S-F, 28.1¢; 61S-O, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 13, 34.3¢ to 79¢; 23 to 25, 36.3¢ to $1.08; 35 to 37, 43.3¢ to $1.66.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 37¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4, ⅛ to 11/32 in., 49.5¢ to 38.5¢; ⅜ to 1½ in., 88¢ to 36¢; 1 9/16 to 3 in., 36¢ to 33¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36.5¢ to 27¢; 52S, 44.5¢ to 32.5¢; 56S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 35¢; 61S-T4, 45¢ to 34.5¢; 75S-T-6, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T5; OD in in.: 1¼ to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.3¢; 4 to 6, 31¢ to 37.8¢; 6 to 9, 31.5¢ to 39.3¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.008; 96 in., $1.344; 120 in., $1.679; 144 in., $2.017. Gage 0.024 in. x 28 in., 72 in., $1.224; 96 in., $1.633; 120 in., $2.042; 144 in., $2.451. **Coiled Sheet:** 0.019 in. x 28 in., 24.7¢ per lb; 0.024 in. x 28 in., 23.7¢ per lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ⅜ in. diam., 10,000 lb; ⅜ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	69	53
Strip, cold-rolled	75	56
Rods and bars	65	51
Angles, hot-rolled	65	51
Plates	67	52
Seamless tubes	98	86
Shot and blocks	..	46

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	35.43	....	35.03
Copper, h-r	....	31.28	....
Copper, drawn	....	32.53	....
Low brass	33.42	33.11	....
Yellow brass	32.03	31.72	....
Red brass	33.89	33.58	....
Naval brass	36.71	30.77	32.03
Leaded brass	....	26.43	30.49
Com'l bronze	34.88	34.57	....
Manganese bronze	40.21	34.10	35.66
Phosphor bronze	53.17	53.42	....
Muntz metal	34.93	30.49	31.74
Everdur, Herculoy, Olympic, etc.	40.14	39.08	....
Nickel silver 10 pct	42.77	46.63	49.71
Arch. bronze	....	....	30.49

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	17.50
Aluminum pig	16.50
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$56.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	22.50
Copper, Lake, Conn. Valley	22.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	21.50
Magnesium, sticks, 100 to 500 lb	37.50¢ to 39.50¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $73
Nickel, electro, f.o.b. New York	51.22
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	44.25
Palladium, dollars per troy oz.	$34.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	72.75
Tin, New York	78.50
Zinc, East St. Louis	14.50
Zinc, New York	15.22
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	21.75-22.00
No. 120	21.25-21.50
No. 123	20.75-21.00
80-10-10 ingot	
No. 305	25.50
No. 315	23.50
88-10-2 ingot	
No. 210	31.50
No. 215	29.00
No. 245	23.75-24.75
Yellow ingot	
No. 405	18.25-19.00
Manganese bronze	
No. 421	23.50

Aluminum Ingot

(Cents per lb, of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.00-20.50
0.60 copper, max.	19.75-20.25
Piston alloys (No. 122 type)	18.00-18.50
No. 12 alum. (No. 2 grade)	17.25-17.50
108 alloy	18.00-18.50
195 alloy	18.75-19.00
13 alloy	20.00-20.25
AXS-679	18.25-18.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	19.00-19.50
Grade 2—92-95%	18.00-18.50
Grade 3—90-92%	17.00-17.50
Grade 4—85-90%	16.50-17.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37⅛
Electrodeposited	31⅝
Rolled, oval, straight, delivered	35.34
Forged ball anodes	39
Brass, 80-20	
Cast, oval, 15 in. or longer	32¾
Zinc, oval	22½
Ball anodes	21½
Nickel 99 pct plus	
Cast	68.00
Rolled, depolarized	69.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	49¼
Copper sulfate, 99.5 crystals, bbl.	10¾
Nickel salts, single or double, 4-100 lb bags, frt allowed	20¼
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	18.25
Zinc sulfate, 89 pct granular	7.15
Zinc cyanide, 100 lb drums	43¼

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	17½	16¾
Yellow brass	14⅝	13⅝
Red brass	16	15¼
Commercial bronze	16⅜	15⅝
Manganese bronze	13⅞	13
Leaded brass rod ends	14⅝	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.00
No. 2 copper wire	18.00
Light copper	16.00
Refinery brass	17.25*
Radiators	12.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	19.00
No. 2 copper wire	18.00
Light copper	17.00
No. 1 composition	15.00
No. 1 comp turnings	14.50
Rolled brass	12.00
Brass pipe	13.50
Radiators	11.75
Heavy yellow brass	11.25-11.50
Aluminum	
Mixed old cast	10.00-10.25
Mixed old clips	10.75-11.00
Mixed turnings, dry	10.00-10.25
Pots and pans	10.00-10.25
Low copper	11.75-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	17 —17¼
No. 2 heavy copper and wire	16 —16¼
Light copper	15 —15¼
Auto radiators (unsweated)	10½—10¾
No. 1 composition	13¼—13½
No. 1 composition turnings	12¾—13
Clean red car boxes	11¼—11½
Cocks and faucets	11¼—11½
Mixed heavy yellow brass	9¼— 9½
Old rolled brass	10½—10¾
Brass pipe	11⅜—12
New soft brass clippings	12¾—13
Brass rod ends	11¼—11½
No. 1 brass rod turnings	11 —11¼
Aluminum	
Alum. pistons and struts	6 — 6½
Aluminum crankcases	8½— 9
2S aluminum clippings	11½—12
Old sheet and utensils	8½— 9
Borings and turnings	5½
Misc. cast aluminum	8½— 9
Dural clips (24S)	8½— 9
Zinc	
New zinc clippings	9¼— 9½
Old zinc	7 — 7½
Zinc routings	4 — 4½
Old die cast scrap	5 — 5¾
Nickel and Monel	
Pure nickel clippings	36 —40
Clean nickel turnings	34 —38
Nickel anodes	37 —41
Nickel rod ends	37 —41
New Monel clippings	15 —19
Clean Monel turnings	10 —14
Old sheet Monel	14 —18
Inconel clippings	20 —24
Nickel silver clippings, mixed	9 —10
Nickel silver turnings, mixed	6 — 7
Lead	
Soft scrap, lead	9¾—10
Battery plates (dry)	5 — 5¼
Magnesium	
Segregated solids	9 —10
Castings	5½— 6½
Miscellaneous	
Block tin	62 —64
No. 1 pewter	41 —43
No. 1 auto babbitt	37 —39
Mixed common babbitt	9¾—10
Solder joints	12½—13
Siphon tops	37 —39
Small foundry type	13 —13½
Monotype	11½—12
Lino. and stereotype	11 —11½
Electrotype	9¾—10
New type shell cuttings	15 —15¼
Hand picked type shells	6½— 7
Lino. and stereo. dross	4¼— 4¾
Electro. dross	2¾— 3

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

No. 1 tops Pittsburgh high in wild market

Steelmaking grades were up sharply again this week in most districts in what is conceded to be the wildest market in history. The big melt and conversion deals shared the blame, along with a sudden buying rush, cross hauling and the usual inflationary factors.

The price of No. 1 heavy melting steel soared in most markets to highs of $47.00 in Pittsburgh (an all-time record), $40.00 in Chicago, $37.00 in Philadelphia and New York, $45.50 in Youngstown, $39.00 in Detroit, Cincinnati and St. Louis, $34.50 in Boston, $42.00 in Buffalo, and $32.00 in Birmingham. Cleveland, however, remained at a high of $43.00. These prices represent increases up to $5.00 a ton.

An unusual angle is that in several places there is a big spread between No. 1 and No. 2 steel. In 1948, No. 2 sold at or near the No. 1 price. Today the spread ranges up to $9.50, in Pittsburgh. In most other active markets the spread is as much as $5.00 to $7.00.

PITTSBURGH—The market scored its biggest gain of the year this week. No. 1 heavy melting jumped $4.50 per ton to a top of $47.00, an all-time record. Mills were paying higher prices for remote scrap, which was moving into Pittsburgh in heavy tonnages. No. 1 bundles from Detroit were bringing $52.50 per ton. Paradoxically, No. 2 steel was unchanged at $37.50, latest price paid for a representative tonnage. Machine shop turnings were up $1.00; short turnings jumped $3.00. Low phos plate was up $5.00 on appraisal, and the railroad list moved up for the same reason.

CHICAGO—Scrap prices in most grades advanced in the Chicago district this week. Mills and brokers are putting pressure on to overcome dealer resistance to selling. The price of No. 1 heavy melting steel is quotable at $40.00 per gross ton, an increase of $2.00. Rumor has it that the mills will come into the market by the end of this week or the beginning of next week.

PHILADELPHIA — The scrap market jumped to new levels last week under the pressure of nation wide peaks in steel operations and the conversion market. The new prices reflect offerings by brokers to fill outstanding commitments. No. 1 melting was higher by $4.50 a ton. Other steel grades advanced $3.00. Turnings were up $1.00 to $2.00. Low phos and rail specialties were up $5.00 a ton. Rail crops were up $2.00 due to higher offerings from rerollers. All cast grades except breakable were up $1.00. Early this week there were Pittsburgh offers for No. 1 melting at $35.00 on cars here.

NEW YORK—Prices were hard to pin down in their rocketing flight but definite increases of up to $5.00 a ton were scored by steelmaking grades. Turnings were up $1.00 to $2.00 a ton and cast scrap was up in sympathy with other grades. The market is generally conceded to be a lot rougher than it was in 1948.

DETROIT—Industrial lists awarded last week appear to have brought some of the highest prices on record here which may be a reason why some sources feel that the Detroit market may have reached its peak. Short interests by brokers combined with frantic efforts of out-of-town buyers to obtain scrap have brought reports of $45.00 to $46.00 and higher for choice industrial bundles although dealer material continues to be held at a discount. Cast grades are firm.

CLEVELAND—Purchase of a tonnage of No. 1 heavy melting steel at $45.50 by a major consumer in the Valley halted temporarily the rapid price advances of the past week. Any further advances are likely to be at a slower pace. The market is very strong but some of the hysteria is gone. On the other hand, buyers seem to be attuned to the new climate of the market. The $48.50 quotation on No. 1 RR heavy melting in Cleveland is based on a sale by a major road and not on what any consumer has paid.

ST. LOUIS—Prices of scrap continue to advance here as a result of buying by mills in the district and out. A large user of No. 1 heavy melting steel came into the market at a $3.00 a ton advance. Users of openhearth and foundry grades are enjoying a heavy demand and a consequent lessening of their raw material piles.

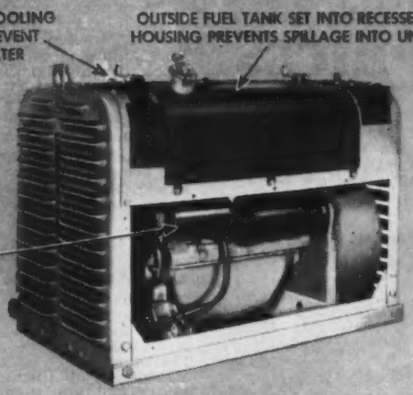
CINCINNATI—Prices of heavy melting grades advanced here on sales of representative tonnages to major consumers in this district. The market is very active with tonnage moving to other districts and efforts to raid this market continue. Dealers are riding the market up, waiting for the top dollar. Foundry grades are rather active.

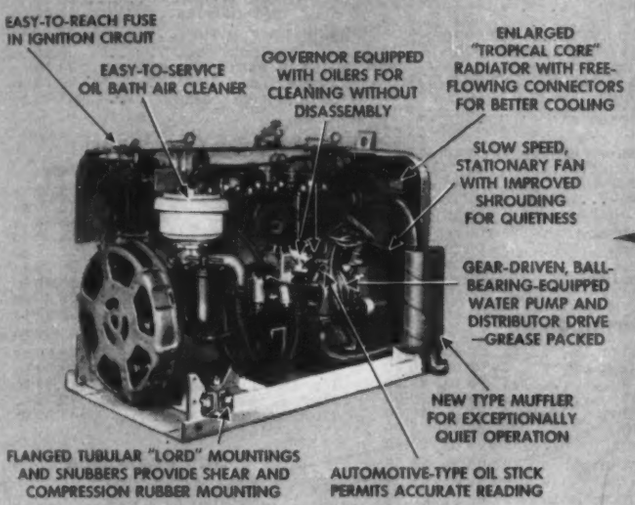
BOSTON—This week provided another sizzling market here with a few scattered bids for No. 1 steel at $35.00 and $36.00 a ton but the great majority of sales were at $33.50 to $34.50. There is still a bad shortage of freight cars curtailing shipments from a market that has shown terrific activity on all fronts.

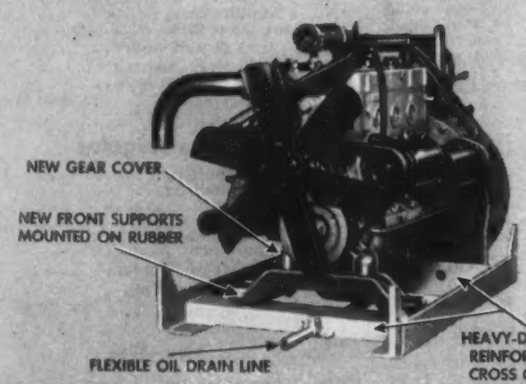
BIRMINGHAM—All scrap prices have been revised upward here this week. Local consumers have raised prices $3.00 to $4.00 per ton and dealers have very little material in their yards. They hope that the higher prices will bring in more material.

BUFFALO — Prices on steelmaking grades soared $5.00 a ton when the prolonged stalemate in the market was broken by sales aggregating approximately 25,000 tons. Purchases were made by the top mill consumer. The mill bought at the outside figure. No. 2 heavy melting climbed to $38.00-$39.00. The railroad scrap list moved up with the steelmaking items. Cast iron tended to mark time.

MORE THAN 16 IMPORTANT NEW CHANGES!







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GAS ELECTRIC POWER UNIT FOR ELECTRIC INDUSTRIAL TRUCK OPERATION

"Making a good unit better" was the theme in the development of the finest, most modern Ready-Power Unit ever presented. Refinement features pointed towards important new advantages: remarkably quiet operation; less maintenance; ease of adjustment and complete accessibility. These add up to even longer life and lower operating costs than previous Ready-Power models offered. The new Ready-Power Model H-A has been work-tested and proven under the toughest of conditions. It is designed to replace existing Ready-Power Model "H" units and older models commonly used on Electric Trucks of the following capacities: 4,000 lb. Fork, 6,000 lb. Crane and up to 10,000 lb. Platform.

The READY-POWER Co.
3822 Grand River Ave., Detroit, Mich.

Write for Complete Information

READY-POWER

Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$46.50 to $47.00
No. 2 hvy. melting	37.00 to 37.50
No. 1 bundles	46.50 to 47.00
No. 2 bundles	35.50 to 36.00
Machine shop turn.	30.50 to 31.00
Mixed bor. and ms. turns.	30.50 to 31.00
Shoveling turnings	34.50 to 35.00
Cast iron borings	33.50 to 34.00
Low phos. plate	49.00 to 49.50
Heavy turnings	39.00 to 40.00
No. 1 RR. hvy. melting	47.50 to 48.00
Scrap rails, random lgth.	43.50 to 44.00
Rails 2 ft and under	45.00 to 46.00
RR. steel wheels	48.50 to 49.00
RR. spring steel	48.50 to 49.00
RR. couplers and knuckles	48.50 to 49.00
No. 1 machinery cast	43.50 to 44.00
Mixed yard cast.	37.50 to 38.00
Heavy breakable cast.	35.00 to 36.00
Malleable	42.00 to 43.00

Chicago

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 factory bundles	37.00 to 38.00
No. 1 dealers' bundles	36.00 to 37.00
No. 2 dealers' bundles	32.00 to 33.00
Machine shop turn.	25.50 to 26.50
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	27.00 to 28.00
Low phos. forge crops	42.00 to 43.00
Low phos. plate	40.00 to 41.00
No. 1 RR. hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	46.00 to 47.00
Rerolling rails	52.50 to 53.50
Rails 2 ft and under	48.00 to 49.00
Locomotive tires, cut	44.00 to 45.00
Cut bolsters & side frames	40.00 to 41.00
Angles and splice bars	47.00 to 48.00
RR. steel car axles	57.00 to 58.00
RR. couplers and knuckles	45.50 to 46.50
No. 1 machinery cast.	48.00 to 49.00
No. 1 agricul. cast.	45.00 to 46.00
Heavy breakable cast.	38.00 to 39.00
RR. grate bars	37.00 to 38.00
Cast iron brake shoes	37.00 to 38.00
Cast iron car wheels	41.50 to 42.50
Malleable	47.00 to 48.00

Philadelphia

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	32.50 to 33.50
No. 1 bundles	36.00 to 37.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	25.00 to 26.00
Low phos. punchings, plate	39.00 to 40.00
Low phos. 5 ft and under	39.00 to 40.00
Low phos. bundles	36.00 to 37.00
Hvy. axle forge turn.	36.00 to 37.00
Clean cast chem. borings	30.00 to 31.00
RR. steel wheels	40.00 to 41.00
RR. spring steel	40.00 to 41.00
Rails 18 in. and under	45.00 to 46.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast	34.00 to 35.00
Heavy breakable cast	35.00 to 36.00
Cast iron carwheels	41.00 to 42.00
Malleable	44.00 to 45.00

Cleveland

No. 1 hvy. melting	$42.50 to $43.00
No. 2 hvy. melting	37.50 to 38.00
No. 1 busheling	42.50 to 43.00
No. 1 bundles	42.50 to 43.00
No. 2 bundles	32.50 to 33.00
Machine shop turn.	26.50 to 27.00
Mixed bor. and turn.	29.50 to 30.00
Shoveling turnings	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Low phos. 2 ft and under	43.50 to 44.00
Steel axle turn.	40.50 to 41.00
Drop forge flashings	42.50 to 43.00
No. 1 RR. hvy. melting	48.00 to 48.50
Rails 3 ft and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
No. 1 machinery cast.	48.00 to 49.00
RR. cast.	48.00 to 49.00
RR. grate bars	36.00 to 37.00
Stove plate	40.00 to 41.00
Malleable	46.00 to 47.00

Youngstown

No. 1 hvy. melting	$45.00 to $45.50
No. 2 hvy. melting	40.00 to 40.50
No. 1 bundles	45.00 to 45.50
No. 2 bundles	$34.50 to $35.00
Machine shop turn.	33.50 to 34.00
Shoveling turnings	35.50 to 36.00
Cast iron borings	35.50 to 36.00
Low phos. plate	46.00 to 46.50

Buffalo

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 busheling	38.00 to 39.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	32.00 to 33.00
Low phos. plate	44.00 to 45.00
Scrap rails, random lgth.	42.00 to 43.00
Rails 2 ft and under	48.00 to 50.00
RR. steel wheels	45.00 to 46.00
RR. spring steel	45.00 to 46.00
RR. couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	37.00 to 38.00
Stove plate	36.00 to 37.00
Small Indus. malleable	40.00 to 41.00

Birmingham

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	37.00 to 38.00
Structural and plate	36.00 to 37.00
Scrap rails, random lgth.	39.00 to 40.00
Rerolling rails	44.00 to 45.00
Rails 2 ft and under	42.50 to 43.50
Angles & splice bars	39.00 to 40.00
No. 1 cupola cast.	36.00 to 37.00
Stove plate	32.00 to 33.00
Cast iron carwheels	33.00 to 34.00

St. Louis

No. 1 hvy. melting	$37.00 to $39.00
No. 2 hvy. melting	31.00 to 33.00
No. 2 bundled sheets	31.00 to 33.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	27.00 to 29.00
Rails, random lengths	40.00 to 42.00
Rails 3 ft and under	45.00 to 47.00
Locomotive tires, uncut	40.00 to 41.00
Angles and splice bars	42.00 to 43.00
Std. steel car axles	52.00 to 53.00
RR. spring steel	43.00 to 44.00
No. 1 machinery cast.	40.00 to 42.00
Hvy. breakable cast.	36.00 to 38.00
Cast iron brake shoes	35.00 to 37.00
Stove plate	36.00 to 37.00
Cast iron car wheels	39.00 to 40.00
Malleable	40.00 to 41.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.00 to $37.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	22.00 to 22.50
Clean cast chem. bor.	24.50 to 25.00
No. 1 machinery cast.	33.00 to 34.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	32.00 to 33.00
Heavy breakable cast.	32.00 to 33.00
Unstrp. motor blocks	22.50 to 23.50

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.50 to $34.50
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	33.50 to 34.50
No. 2 bundles	$26.00 to $27.00
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	18.00 to 18.50
Shoveling turnings	20.00 to 21.00
No. 1 busheling	31.00 to 32.00
Clean cast chem. borings	20.50 to 21.00
No. 1 machinery cast.	32.00 to 33.00
No. 2 machinery cast.	27.50 to 28.50
Heavy breakable cast.	26.00 to 27.00
Stove plate	26.50 to 27.50

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	43.00 to 44.00
New busheling	41.00 to 42.00
Flashings	38.00 to 39.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. plate	42.00 to 43.00
No. 1 cupola cast.	42.00 to 43.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	37.00 to 38.00
Automotive cast.	46.00 to 47.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$38.50 to $39.00
No. 2 hvy. melting	33.50 to 34.00
No. 1 bundles	38.50 to 39.00
No. 2 bundles, black	32.50 to 33.00
No. 2 bundles, mixed	27.50 to 28.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and turn.	23.00 to 23.50
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low phos. 18 in. under	43.00 to 44.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	49.00 to 50.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	39.00 to 40.00
Drop broken cast.	47.00 to 48.00

San Francisco

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		13.00
Machine shop turn.		9.00
Elec. fur. 1 ft and under		28.00
No. 1 RR. hvy. melting		20.00
Scrap rails, random lgth.		20.00
No. 1 cupola cast.	$32.50 to	34.00

Los Angeles

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		13.00
Mach. shop turn.		5.00
Elec. fur. 1 ft and under		30.00
No. 1 RR. hvy. melting		20.00
No. 1 cupola cast.	$37.50 to	40.50

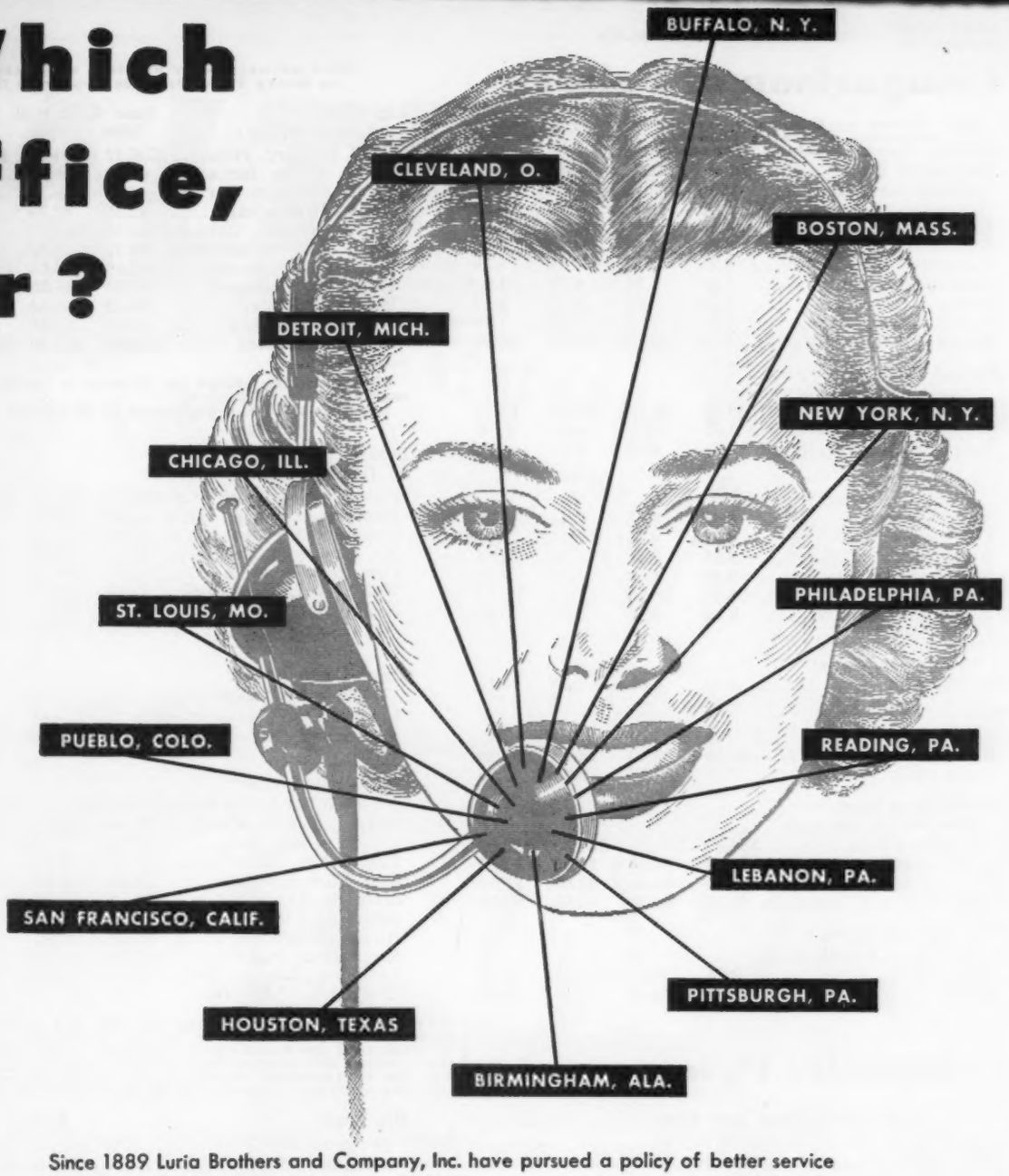
Seattle

No. 1 hvy. melting		$18.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		12.00
Elec. fur. 1 ft and under	$29.00 to	30.00
RR. hvy. melting		19.00
No. 1 cupola cast.	30.00 to	35.00
Heavy breakable cast.		20.00

Hamilton, Ont.

No. 1 hvy. melting	$27.00
No. 1 bundles	19.00
No. 2 bundles	19.00
Mechanical bundles	25.00
Mixed steel scrap	23.00
Mixed bor. and turn.	20.00
Rails, remelting	27.00
Rails, rerolling	30.00
Bushelings	21.50
Bush., new fact, prep'd.	25.00
Bush., new fact, unprep'd.	20.00
Short steel turnings	20.00
Cast scrap	40.00

Which office, sir?



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The expansion of our organization, with offices located in 15 major cities, is in accordance with our policy to give better service to our customers.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

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Philadelphia 7, Pennsylvania

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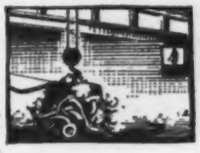

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SAN FRANCISCO, CAL. Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	June 6, 1950	May 30, 1950	May 9, 1950	June 7, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plates	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	June 6, 1950	May 30, 1950	May 9, 1950	June 7, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$50.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	45.47
No. 2, Birmingham	42.38	42.38	42.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	49.74
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	68.24
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$46.75	$42.25	$35.75	$22.50
Heavy melt'g steel, Phila.	36.50	32.00	28.00	21.00
Heavy melt'g steel, Ch'go	39.50	37.50	32.50	21.50
No. 1 hy. com. sh't, Det.	43.50	39.50	34.25	15.75
Low phos. Young'n	46.25	45.75	36.75	23.25
No. 1, cast, Pittsburgh	43.75	42.75	41.50	26.50
No. 1, cast, Philadelphia	39.50	38.50	37.50	28.00
No. 1, cast, Chicago	48.50	47.50	45.50	27.50
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.25
Foundry coke, prompt	16.25	16.25	16.25	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	22.50	20.50	19.50	17.625
Copper, Lake, Conn.	22.625	20.625	19.625	18.625
Tin Straits, New York	78.125†	78.00*	76.50	$1.03
Zinc, East St. Louis	14.50	12.50	12.00	10.75
Lead, St. Louis	11.80	11.80	11.05	11.85
Aluminum, virgin	17.50	17.50	17.00	17.00
Nickel electrolytic	51.22	42.97	42.97	42.93
Magnesium, ingot	21.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

† Tentative. * Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
June 6, 1950	3.837¢ per lb.	$46.38 per gross ton	$40.92 per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	37.25 per gross ton
One month ago	3.837¢ per lb.	46.38 per gross ton	32.08 per gross ton
One year ago	3.705¢ per lb.	45.91 per gross ton	21.67 per gross ton

	Finished Steel High		Finished Steel Low		Pig Iron High		Pig Iron Low		Scrap Steel High		Scrap Steel Low	
1950	3.837¢	Jan. 3	3.837¢	Jan. 3	$46.38	Feb. 7	$45.88	Jan. 3	$40.92	June 6	$26.25	Jan. 3
1949	3.837¢	Dec. 27	3.3705¢	May 3	46.87	Jan. 18	45.88	Sept. 6	43.00	Jan. 4	19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396c	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$19.17	Apr. 10
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	23.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1935	2.07642¢	Oct. 1	2.06492¢	Jan. 8	18.84	Nov. 5	17.83	May 14	13.42	Dec. 10	10.33	Apr. 29
1932	1.89196¢	July 5	1.83910¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 5
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron as Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

ALTER

A NAME TO REMEMBER IN . . .

STAINLESS STEEL

SCRAP

AND ALL GRADES OF NICKEL AND ALLOY SCRAP

Cast Iron
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Non-Ferrous Metals

Over 50 Years

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1700 ROCKINGHAM ROAD DAVENPORT 2, IOWA

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 31
Alloy, net ton	$51.00 1.17													$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 13		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.3	$63.00 4			$63.00 25		$63.00 3.4	$65.00 26	$63.00 3			$66.00 31
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 4.42		$66.00 13	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$66.00 31
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.33	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 33	3.35 1.6.8	3.35 4.5			3.35[1.4.6] 13 3.50		3.35 3	3.45 26		3.35 3		3.35[12] 47 4.15
Cold-rolled	4.10[1.5.7.9.15] 5.10[33]		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65[24] 4.75[44]					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40[6] 4.90[76]						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi str. low alloy, galv.	6.75 1											6.75 3		
STRIP Hot-rolled	3.25 5.7.9.28	3.25 3.66	3.25 1.6.8	3.25 5			3.25[1.4.6] 13 3.50		3.25 3	3.35 26		3.25 3		3.45[12] 47 4.05
Cold-rolled	4.15 5.7.9.63	4.30 3.66	4.30 8	4.15 9.5		4.15 7	4.15 4.6.40.48.49 13 4.50		4.15 3			4.15 3		4.35[12] 47 4.95
Hi str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.40 3			6.40 3		6.40 12
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10[5] 4.15[2.4] 17.32.69.71	4.15[2] 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.22.82		4.15 6.40.57		4.15 70					4.35[12] 4.30[24]
Alloy, hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.32.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.82		4.90 6.25.57	4.90 3	4.90 3.70					5.09[24]
Hi str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.50 3	3.60 26	3.50 3	3.50 8		3.75 12
Floor Plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 26	4.40	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.3	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.20 3	5.20 3		5.20 3			
MANUFACTURERS' WIRE Bright	4.50 2.5.18	4.50[2] 4.12.32.34		4.50 2.77			4.50 6	Kokomo=4.60[30]			4.50 3	4.60 3	Duluth=4.50[2] Pueblo=4.75[14]	
PILING, Steel Sheet	4.20[1.9]	4.20 1							4.20 3					

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging, net ton
	$59.00 83				Alloy, net ton
		$53.00 11	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00 83	$63.00 11	F=$82.00[19]	Geneva=$63.00[16]	Carbon forging billets, net ton
	$74.00 83		F=$85.00[19]		Alloy net ton
					PIPE SKELP
	4.25 83	3.85 11	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35 4,11	SF,LA=4.05[24] F=4.25[19]	Ashland=3.35[7] Niles=3.50[84]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4,11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.65 83	3.25 11	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.65[2,68]	Cold-rolled
		4.95 11	F=6.64[19]		Hi Str. low alloy, h. r.
			F=6.95[19]		Hi Str. low alloy, c.r.
		7.60 11	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Holloware enameling
4.05 83	3.85 83	3.45 4,11	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05 83	3.85 83	3.45 4,11	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 83	4.35 83		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20 11	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 83	3.50 4,11	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.85[15]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates,
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 83	3.80 83	3.40 11	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10 83	4.90 83	4.50 4,11	SF, LA=5.45[24,62]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes deduct $1.15 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principle Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24. Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

To dealers, f.o.b. mill	*Base Column*	*Pittsburg, Calif.*
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	*Pittsburg, Calif.*
Merch. wire, annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.

‡‡ Less 20¢ to jobbers.

§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated**	8.85
Track bolts, heat treated, to railroads**	9.10

** Minnequa, deduct 25¢. † Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	*Black*	*Galv*
⅛-in.	40½ to 38½	24 to 22
¼-in.	43½ to 41½	28 to 26
1-in.	46 to 44	31 to 29
1¼-in.	46½ to 44½	31½ to 29½
1½-in.	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31
Steel, lapweld		
2-in.	38	22½
2½ to 3-in.	42	26½
3½ to 6-in.	43 to 40	27½ to 24½
Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½
Wrought Iron, buttweld		
⅛-in.	+26½	+53
¼-in.	+16½	+42
1 & 1¼-in.	+10½	+33
1½-in.	+ 4½	+29½
2-in.	+ 4	+29
Wrought Iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
9 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
⅛-in.	39½ to 37½	24½ to 22½
¼-in.	43½ to 41½	28½ to 26½
1-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½
Steel, lapweld		
2-in.	37	22½
2½ to 3-in.	42	27½
3½ to 6-in.	44½ to 41½	30 to 27
Steel, seamless		
2-in.	35	20½
2½ to 3-in.	38	24½
3½ to 6-in.	42½	28
Wrought Iron, buttweld		
⅛-in.	+22	+47
¼-in.	+15½	+40
1 to 2-in.	+ 5½	+29
Wrought Iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8-in.	list	+31½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

Prices continued on next page

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.15	6.39[1]	6.46–6.46[2]	5.59–5.59[11]	....	6.04[11]	5.89	5.79[11]	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.15[10]	5.95	6.15[7]	5.10[10]	....	5.40	5.25	5.10[10]	5.88	....	....	....	....
Boston	5.75	6.55[10]	7.74[8]	5.70	6.90–6.95	5.08	5.75	5.60	6.19–6.69	9.70–9.97	8.50–10.00	11.15	11.45
Buffalo	5.15	5.95	6.90	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.90	11.05	11.35
Chicago	5.15	5.95	6.75	5.10	6.80	5.40	5.25	5.10	5.85	9.25	9.55	10.70	11.00
Cincinnati*	5.42–5.97	5.99–6.24	6.34–6.39	5.35	....	5.79–5.79	5.64	5.35–5.54	5.96–6.25	9.60–9.81	9.90–10.11	11.05–11.26	11.35–11.56
Cleveland	5.15	5.95	7.00	5.24	6.35	5.52	5.37	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27–6.58	5.79	5.64	5.39	5.91	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35–10.45	10.50–10.60	11.50	11.95–12.10
Indianapolis	....	....	....	....	7.36	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.00	7.50[2]	5.85	8.35[16]	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.29	6.09	6.84	5.24	6.32	5.54	5.39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55–5.65	6.54–6.64[1]	7.25[2]	5.84	6.76[5]	6.10	5.65	5.95	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	5.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Philadelphia*	5.30	6.20	6.70[2]	5.65	6.29	5.45	5.25	5.50	6.21	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.50	5.20	6.00	5.15	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.80–7.10[1]	8.40[2]	8.20[2]	6.85[3]	....	6.40[3]	6.50	6.45–6.45[3]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	6.85	6.70	8.75	7.45	8.75	6.10[3]	5.90	7.35[3]	8.75	....	....	....	....
San Francisco*	6.25[11]	7.60[2]	7.55[2]	6.75[11]	7.85[16]	6.15[11]	6.00[11]	6.15[11]	7.55	10.05	10.20	11.70	12.10
Seattle	6.60[4]	8.15[2]	8.20[2]–8.35[2]	6.85[4]	....	6.35[4]	6.20[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[18]
St. Louis	5.48	6.28	7.08	5.43	6.68–7.54	5.73	5.58	5.43	6.08	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.26	5.66	6.16–6.82	5.96	5.81	5.66	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES: *(Standard unless otherwise keyed on prices.)* Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....	Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Birmingham	41.88	42.38	.....	.....	.....	Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Buffalo	48.00	48.50	47.00	.....	.....	Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Chicago	48.00	48.50	48.50	47.00	...	Cincinnati	Birmingham	6.70	48.58	49.08	.....	.....	.....
Cleveland	48.00	48.50	48.50	47.00	51.00	Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Duluth	48.00	48.50	48.50	47.00	.....	Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Erie	48.00	48.50	48.50	47.00	.....	Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Everett	.....	50.50	51.00	.....	.....	Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Granite City	47.90	48.40	48.90	.....	.....	Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Ironton, Utah	48.00	48.50	.....	.....	.....	Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Pittsburgh	48.00	48.50	48.50	47.00	.....	Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
Geneva, Utah	48.00	48.50	.....	.....	.....	San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Sharpsville	48.00	48.50	48.50	47.00	.....	Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Steelton	48.00	48.50	49.00	49.50	54.00	St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Struthers, Ohio	48.00	.....	.....	.....	.....	Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....								
Toledo	48.00	48.50	48.50	47.00	.....								
Troy, N. Y.	48.00	48.50	49.00	.....	54.00								
Youngstown	48.00	48.50	48.50	47.00	.....								

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

here's what they say about

CrysCoat

for preparing metal surfaces for painting, there is nothing to equal the OAKITE CrysCoat* PROCESS!

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Continued

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago) Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. & shorter	26	37
All diam, longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	25 37
9/16 to ⅝ in.	23 35
¾ to 1½ in. inclusive	23 35
1⅝ in. and larger	16 29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger) Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	$7.25

Small Rivets

(7/16 in. and smaller)

	Pct Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

ELECTRODES

Cents per lb., f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
	CARBON	
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
20	84, 90	7.50¢
17	60, 72	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct, Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon 10 pct, Coatesville (26)	27.50	
Inconel-carbon 10 pct, Coatesville (21)	36.00	
Monel-carbon 10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	21.00
St. Louis, del'd	21.60
Birmingham, del'd	20.20

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$37.00
60% or less	34.00

REFRACTORIES (*F.o.b. works*)

Fire Clay Brick *Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa., ... 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed... $56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk 33.00
in sacks 38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢... $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags.... 7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East ..... 10.00¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe.. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe 70.0¢ to $1.35
Aluminum ..... 31.50¢
Brass, 10 ton lots ..... 23.50¢ to 27.25¢
Copper, electrolytic ..... 27.75¢
Copper, reduced ..... 27.00¢
Cadmium, 100-199 lb $2.95
Chromium, electrolytic, 99% min., and quantity $3.50
Lead ..... 17.00¢
Manganese ..... 52.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 56.00¢ to 66.00¢
Nickel, annealed ..... 72.00¢
Nickel, spherical, unannealed 69.00¢
Silicon ..... 34.00¢
Solder powder ..... 8.5¢ plus metal values
Stainless steel, 302 ..... 75.00¢
Tin ..... 85.75¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.75¢ to 18.50¢

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago.. $91.80 to $95.30
6 to 24-in. del'd N. Y. ... 91.00 to 92.00
6 to 24-in., Birmingham .. 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $103.50 to $113.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.
F.o.b. Birmingham $174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont. $172
F.o.b. Johnstown, Pa. $174
F.o.b. Sheridan, Pa. $172
F.o.b. Etna, Clairton, Pa. $175
$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk 10.45
Ton lots 12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
Carload, packed 35.5
Ton lots 37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
Carloads 28
Ton lots 30
Less ton lots 32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 18.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.
Carload bulk 8.95
Ton lots 10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet 10.30
Ton lots 11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.
96% Si, 2% Fe 20.70
97% Si, 1% Fe 21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.
Carload, bulk 6.30
Ton lots 7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

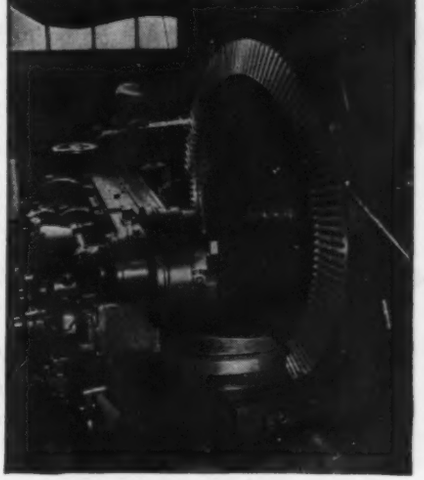
Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

Prices Continued on Next Page

LARGE INDUSTRIAL GEARS



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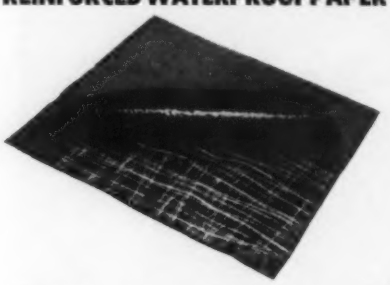

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Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	$1.09
0.50% max. C	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo	96¢
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$3.50
Less ton lots	3.55
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$2.67
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	$1.13
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$160.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices, per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb, up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

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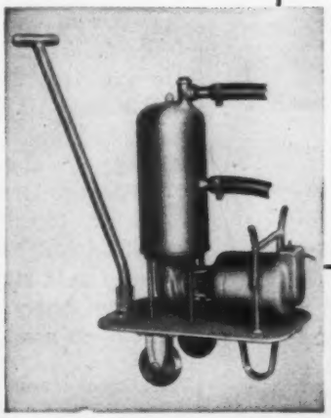

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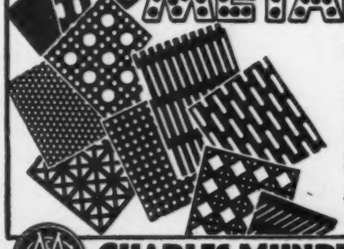

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Qu.	HP	Make	Type	Volts	Speed
1	1000	Whse.	CW	2300	720
2	700	Whse.	CW	2200	900
1	600	G.E.	MT-412	440/2300	705
1	500	G.E.	IM	2200	450
1	500	G.E.	IP	550	585
2	350	Whse.	CW	2200	900
1	350	G.E.	MT-442Y	2200/4600	253
1	300	Al. Ch.		2300	505
1	300	G.E.	IP	440/2300	705
5	300	Al. Ch.		440/2200	705
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-5598	2200	1800
2	100	G.E.	IM	2200	435
2	100	G.E.	IM	440	600

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1	250	G.E.	KT-559	440	1730
1	200	G.E.	IK	550	805
1	200	G.E.	KT-557	440	1800
1	200/100	G.E.	KT-557	440	1180/885
2	150	Whse.	CS-874C	440	700
1	125	G.E.	KF-6328-Z	440/2200	3585
1	125	Whse.	MS	440	485
1	125(NEW)	G.E.	KF-TEFC	440	1190
2	100	G.E.	KT-543	220/440	1750

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2	3500	G.E.	TS	2300	257
1	2100	G.E.	ATI	4600	514
2	2000	Whse.		2300	120
1	1470	Whse.		2300/4600	900
1	1000	Whse.	Mill	2300	189.5
1	900	Al. Ch.		2200	150
1	600	Whse.		440	360
2	350	G.E.	TS	2200	150
1	320	G.E.	ATI	2300	600
1	300	G.E.	ATI	440	720

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

European Potential—Philadelphia used machinery dealers trying to fill in the peaks and valleys in their sales volume are becoming increasingly interested in the foreign sale of used machinery. Recent developments have created a more optimistic viewpoint on the part of foreign buyers.

Inquiries from South America are growing. There is a feeling that a new United States loan is forthcoming. It will permit the buying of capital equipment.

This development is expected to affect Brazil and Argentina, particularly. Venezuela has had dollar funds right along, but the situation there is beginning to tighten up now.

Electrical Items Up—There is now a good trade in used large size electrical equipment in the Philadelphia market. One of the principal operators in the field is located here and is doing business on a national scale and exporting. Steel mill buying, he estimates, represents 90 pct of the business.

Chicago Business Up—The generally good business situation of the country is having its effect on the machinery dealers in the Chicago area. Business, although a little spotty, is starting to pick up. It has shown improvement and optimism is being felt. Some dealers who were not buying at the beginning of the year are returning to the market.

Auctions Still Hurt — Although auctions have slowed down a bit recently, they have had their effect on the machinery dealers. Increased promotional activities of auctioneers have brought to the auctions many consumers who normally would have gone to dealers. Auctioneers have expanded their mailing lists to gain wider publicity for their sales.

Another factor helping the auction people is that an unusual number of good plants, large and small, have been put up for auction. Before the war the majority of plants put up for auction were bankruptcies. Now, however, the majority of plants put up for auction are voluntary liquidations.

Philadelphia NISA—The Quaker City chapter of the National Industrial Service Assn. recently held its local meeting at Beck's On the Boulevard. Presiding officer Joseph H. Previty introduced guest speaker Samuel Heller of Consolidated Electric Co., New York, who spoke on the topic: "The Data Rule For Computation of Motor Windings."

The group present also elected the following officers: J. G. Persson, president; J. B. Wagner, vice-president; and W. M. Hendrickson, treasurer. The executive committee was designated as A. Albertson, A. C. Baumann, and M. H. Eisenhardt.

Larger Quarters—The Robert W. Rice & Co. of Chicago is moving from its present location to 210 S. Clinton St., according to an announcement made by Mr. Rice, president of the company. The new location will give the company the advantage of enlarged quarters, and air conditioned offices and sales rooms. The building will also be occupied by the Malco Machinery Co. which will move in shortly.

ECA Aid — Marshall Plan authorizations have been approved for the purchase of $633,000 worth of machine tools by Trieste. This is the largest authorization to Trieste for industrial materials.

Machinery Stock List—Over 200 used and rebuilt production machines are categorically listed in illustrated stock list. *T. R. Wigglesworth Machinery Co.*

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